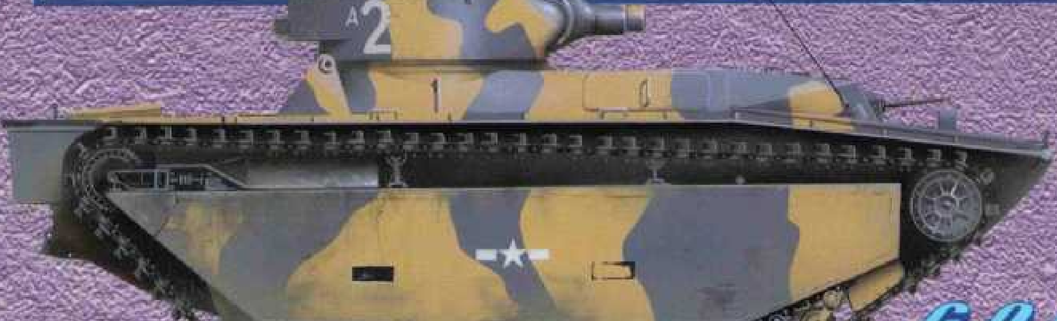
ARMOR AT WAR SERIES

7032

US Amtracs and Amphibians at War 1941-45

Steven J. Zaloga and George Balin



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Text by Steven J. Zaloga & George Balin
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INTRODUCTION

Amphibious assault is one of the most difficult challenges in modern warfare. The defender has a natural advantage since the sea poses a formidable natural barrier to most military operations. With the advent of powerful coastal guns and steel-reinforced concrete fortifications, amphibious assault became all the more difficult. But amphibious assault also has it advantages. Coastlines are often long, and it is impossible to defend all locations. If a weak spot can be found, forces can be landed in relative safety. Until World War II, amphibious landings were conducted by improvised means, usually using ship's boats. In World War I, with major amphibious assaults such as Gallipoli, attempts began to develop specialized craft better suited to amphibious landings, based on river barges. Further experimentation in the 1930s led to a whole range of practical craft from the small LCVP to the large LST. Although these naval craft were essential to modern amphibious assaults, they had one problem. They could only transport the troops to the water's edge, at which point they could go no further. So there was some interest in amphibian craft, that is, craft that could not only swim ashore, but once reaching the beach, could move on land.

The US Marine Corps experimented with a number of amphibious vehicles in the 1920s and 1930s, including an amphibious tank developed by the brilliant, eccentric inventor, J. Walter Christie. Attempts were also made to land light armored vehicles by attaching pontoons to them. But the first successful amphibious vehicle developed in the United States was not actually designed for the military. Donald Roebling, grandson of the legendary builder of the Brooklyn bridge, developed a tracked vehicle called the Alligator to traverse flooded regions in the Florida swamps for rescue purposes. The Marine Corps showed interest in the military possibilities of the vehicle, and in 1940 funded the development of an improved vehicle more suited to amphibious warfare. The Navy was very unenthusiastic about the vehicle, feeling that it was very clumsy in the water compared to conventional landing craft. But the Marine Corps was persistent. One of the problems with the early Roebling designs was that they were not very durable since Roebling did not have a large production facility to assist him. The Marine Corps linked him up with the Food Machinery Corporation (FMC) in California, which provided the engineering assistance needed to turn the design into a more robust military vehicle. FMC would subsequently design and build most US amphibious tractors.

Due to the obstinate pressure of the Marine Corps, the Navy finally relented and a contract was awarded to FMC to build the first 200 vehicles, called LVT-1 for Landing Vehicle, Tracked. The first was completed in July 1941 before the outbreak of the war. The Marines did not intend to use the vehicle for contested landings, and so it was not armored. Rather, it was intended to transport personnel and supplies ashore. The LVT-1s were assigned to amphibious tractor battalions. As a result, they soon became called "amphtracs", later contracted to "amtracs". This name stuck with them until the 1980s when the Marine Corps began calling them AAVs or amphibious assault vehicles.

While the Marines were working on the amtracs, the US Army was working on an amphibious truck. The Office of Scientific Research and Development (OSRD) had already sponsored the development of an amphibious utility vehicle which eventually emerged as the Ford GPA "Seep", essentially an amphibious jeep. However, this was too small to carry troops or cargo. Since Germany occupied most of the European continent, it was obvious that Allied forces would have to conduct amphibious landings against the European coast. One of the main concerns was supplying the forces once ashore. The head of the Armored Forces, Gen. Jacob Devers, suggested that the design be undertaken by General Motors Pontiac Division and based on the Army's standard GMC 2 _ ton truck. Development of the pilot model began on 24 April 1942 and was completed by early June 1942. An initial production order for 2,000 was authorized and it was designated as the DUKW by General Motors. Although it is widely assumed that DUKW was some sort of acronym selected to make it sound the amphibian bird, the duck, this was not the case. It was in fact a GMC production code, the D indicating 1942 development, the U indicating Utility Amphibian, the K indicating front wheel drive and the W indicating two rear-driving axles.

The DUKW and the amtrac were both designed to fulfill the same function: to move supplies from ship to shore, and then beyond the immediate beach-head. The difference in approach between the US Marines and the US Army was due to their different operational needs. The Marines were oriented toward the Pacific, and they knew that most of the islands where they were likely to fight were undeveloped, with few if any roads. The terrain was simply too rough, and often too marshy and wet, to operate an amphibious truck. The Army, on the other hand, was most concerned about its future actions in Europe. Nearly all major beaches in Europe were close to an existing road network. Once ashore, their DUKWs would have access to useable roads. A truck promised to be easier to operate and more durable for long range transport than a tracked vehicle. As a result, the DUKW became the dominant amphibious vehicle of the European theater, while the amtrac was the dominant amphibian in the Pacific. Both types were used in both theaters, but correspondingly in much smaller numbers.

The Amtracs Enter Combat

The LVT-1 amtrac was the first of the amphibians into combat. The US Marine Corps formed two amtrac battalions, the 1st and 2nd Amphibian Tractor Battalions, and deployed them to the Solomons in August 1942. They were used to move supplies ashore at Guadalcanal, and later at other locations during the Solomons campaign including Bougainville and Rendova. The Marines were impressed with their capabilities, especially in the harsh jungle conditions. The main problem with the vehicles was their lack of durability. The Marines hoped that this would be cured with the introduction of a new amtrac, the LVT-2 Water Buffalo, that had been designed from scratch to military specifications. The Atlantic Fleet Marine Force made use of a small number of LVT-1 amtracs during the landings in North Africa in November 1942, but their appearance was hardly noticed by US Army planners.

Although highly valuable for logistics support, Marine officers began to recognize that the amtrac could play a much more vital role in amphibious operations. Major Gen. Howland M. (Howlin' Mad) Smith, commander of the Atlantic Fleet Amphibious Force in March

1942, recommended that they be used in the initial waves of assault landings against contested beaches, since they could traverse swampy areas and coral reefs that would be impassible to conventional landing craft. As the Marines began to plan for amphibious assaults on Japanese island strong-holds in the Central Pacific, Smith's arguments were seriously considered. Lt. Col. Victor H. ("Brute") Krulak, who had been instrumental in organizing the early amtrac battalions, was assigned the task of determining whether amtracs could survive in harsh surf and reef conditions. A series of tests off New Caledonia in April 1942 convinced the Marines that they could take the punishment.

As a result, planning for the assault on the Gilberts in the fall of 1943 included the use of about a hundred amtracs to carry the first waves ashore. The first target of the attack would be Betio island in the Tarawa atoll. This coral outcropping had been heavily fortified and was defended by the Japanese equivalent of the US Marines, the crack Special Naval Landing Forces (SNLF). The Japanese commander boasted it would take a "million men a hundred years" to take Tarawa. The 2nd Amphibian Tractor Battalion had a nominal strength of 100 LVT-1, but most had exceeded their life expectancy during the Solomons operation. Eventually, 75 were prepared for the Tarawa operation, and a further 50 new LVT-2 amtracs were added to these. Since the amtracs had not been designed to encounter hostile fire, the Marines fitted improvised armor to the front of the driver's compartment of the amtracs. The availability of the amtracs was an advantage in other respects. The Japanese defenses had been oriented toward the most likely avenue of attack, from the sea side of the atoll. But with the amtracs available, the attack could proceed into the lagoon, then attack over the coral reef against the more poorly defended inner beaches. This added an important element of surprise to the attack. The attack on Betio on 20 November 1943 was one of the bloodiest and most difficult in Marine Corps history. The first wave included 42 amtracs followed by the remaining amtracs in two more waves. The initial waves met withering fire from artillery, machine guns and mortars. The amtracs were especially vulnerable once they reached land, since the appliqué armor protected only a small portion of the front of the vehicle. By the end of the day, only 35 of the original 125 amtracs were still operating. About 35 had been sunk by gunfire in the water, 26 knocked out by gunfire and mortars on shore, nine had burned out on the coral reef after being hit, two had blown up on mines, and eight of the old LVT-1s had broken down for mechanical reasons. In spite of the losses, the amtrac had been essential to the landings. The subsequent waves of troops in LCVP landing craft had been slaughtered. On reaching the coral reefs, the Marines had to disembark from the LCVPs and then wade ashore through the surf, under constant Japanese machine gun fire. Tarawa made it perfectly clear that amtracs would be needed in any future assault landing against a contested beach.

The first use of DUKWs during the invasion of Sicily in July 1943 was not as dramatic as the use of amtracs at Tarawa. The DUKWs were the "secret weapon" of the Sicily landings and were an unqualified success. The US Army intentionally kept the DUKW classified until Sicily. The Germans and Italians expected the landings near a major port, since it was presumed that any invasion would require the logistics infrastructure of a major port as had been the case in the North African landings. But the DUKWs provided the landing force with the element of surprise, since the landings could take anywhere there were trafficable roads. Besides being used by the US Army, DUKWs were also provided to British forces for Operation Husky. Britain would eventually receive about a quarter of total DUKW production, 3,240 vehicles. Unlike amtracs in the Pacific, the DUKWs were not used in the initial attack waves. They were used solely for logistical support. After the initial landings, they provided 90% of all the supplies that came ashore on the second and third day of the Sicily operation until neighboring ports could be captured.

Evolution of the Amtrac

There had been some interest in an armed version of the amtrac ever since it was first tested in 1941. It was evident that such a vehicle would probably be subjected to fire in return, so it would have to be armored. However, due to the need to keep the amtrac light enough to float, the armor would have to be light, only enough to stop small arms fire. The first of the armed amtracs was based on the new LVT-2. It used an armored superstructure with a modified light tank turret. The turret was essentially the same as the one used on the M3A3 and M5A1 light tanks, except that it lacked the rear radio bustle. The new armed amtrac was designated as the LVT(A)-1, the A indicating armored. To distinguish these from the troop carrying amtracs, they were often called amtanks.

The US Army was beginning to pay attention to the Marine vehicles, and planned to acquire them for its Pacific operations. The Army was interested in a version of the LVT-2 with armored protection. This was essentially the same as the LVT(A)-1 without the superstructure aft the driver's compartment. The LVT(A)-2 resembled the normal LVT-2, but had a slightly different driver's compartment configuration with two hatches in the roof, and only one vision port, for the driver, on the front of the compartment, taken from the LVT(A)-1 design. Production of the LVT(A)-1 began in 1943 for both Marine Corps and Army requirements. The LVT(A)-2 was procured only by the US Army, but after March 1944, all normal LVT-2s were manufactured with armor plate for the driver's compartment without a change in the basic designation.

From the outset, it was realized that the firepower of the LVT(A)-1 left a lot to be desired. As a result, the design of a second amtank was begun, using the turret from the M8 75mm howitzer motor carriage. Since the turret ring was significantly larger, the superstructure had to be extended back, forcing the deletion of the two scarf machine gun rings on the LVT(A)-1. The new vehicle was designated as the LVT(A)-4, and became available in time for the summer 1944 amphibious landings.

A fourth member of the LVT-2 family was also under development at this time and would emerge in 1944 as the LVT-4. The major difference in this design was the use of a large ramp at the rear to make it easier to load cargo in and out of the amtrac. On the previous amtracs, the cargo or personnel were carried in an interior bay. For troops to exit, they had to jump over the sides, which was dangerous when the vehicles were under fire. It was also less than ideal when carrying cargo since it meant that any heavy loads that could not be lifted by the troops would have to be loaded and removed using cranes. The addition of a drop ramp at the rear of the LVT-4 meant that supplies could be wheeled into the cargo hold on trailers.

This forced the redesign of the vehicle, since it meant moving the engine. An armored version of the LVT-4 was designed, the LVT(A)-3, but it was never series produced.

By 1943, the tactics and organization of amtrac units had begun to mature. The Marine Corps organized eleven amphibian tractor battalions, each with 100 amtracs under the 1943 organizational structure. At first, these were assigned one per Marine division, but in the spring of 1944, they were taken from divisional control and put under corps control for better co-ordination during the increasingly large and complex amphibious operations. The Marine Corps also formed three Armored Amphibian Battalions, equipped with 72 LVT(A)-1 or LVT(A)-4 amtanks. The Army followed along similar lines. The first amphibious tank battalion, the 708th, was formed in December 1943 on the basis of an existing medium tank battalion. It was equipped with 75 amtanks and 12 amtracs, and the Army eventually formed seven such units. The Army also formed 23 amtrac battalions, each with 119 amtracs. Although the Marine Corps pioneered the amtrac and amtank concept, the Army actually formed more amtrac units, and also acquired more than 55 percent of all amtracs manufactured during the war.

Amtanks in Combat

The operational debut of the amtank took place in February 1944 during the Central Pacific fighting in the Marshalls. The Marines made use of the 1st Amphibian Tractor Battalion at Kwajalein. While effective enough, the Marshalls fighting was not a serious test of the viability of the new design or of the new amphibian formations. The real test came in the summer of 1944 during the campaign for the Marianas. The initial attack was launched against Saipan on 15 June 1944. The Saipan landings involved a total of 138 amtanks and 453 amtracs. It was the combat debut for the Army's first amtank unit, the 708th Amphibious Tank Battalion, and both the LVT(A)-1 and LVT(A)-4 were used in quantity for the first time. In addition, the Marianas fighting saw the operational debut of the new LVT-4 amtrac with the Marines.

The Saipan landings were fundamentally different from Tarawa. Due to the greater geographic depth of the island, the Japanese did not mount the main defense on the beach itself. Instead, the beach areas were covered by artillery and mortars positioned further inland. So the landings were made without the stinging casualty levels of Tarawa. The initial wave of the landings were made by the amtanks, followed by three or four waves of amtracs. The terrain permitted the amtanks to penetrate beyond the beaches, and into the countryside. The amtanks were used to provide fire support for the Marines during attacks inland, and the amtracs were often used to move the Marines forward from the beaches. While the Marines appreciated the versatility of the new amtanks, they were not without their problems. To begin with, the armor on the amtanks was minimal and could stop only small arms fire. They were vulnerable to heavy machine gun fire, any type of artillery, and to mortar fire. This was not as great a problem in the water, since the bulk of their hull was protected underwater. But once on land, their enormous hull was vulnerable to enemy fire. The Army and Marines found the 37mm gun on the LVT(A)-1 to be inadequate. It was not very useful in engaging Japanese bunkers and dug-outs, which were by far the most common target. The 75mm howitzer on the LVT(A)-4 was better in this respect. On the other hand, both the Marines and Army tankers were critical of the lack of machine gun tubs on the LVT(A)-4. Close-in attacks by Japanese infantry were common, and the LVT(A)-4 was poorly protected from such attacks. Machine guns fitted to the turret were exposed to enemy fire. The open turret on the LVT(A)-4 was not popular since it was vulnerable to sniper fire. Saipan showed that the amtanks were most useful in the initial phase of the landings, and in securing the beach area itself. For close support operations with the infantry beyond the beach, normal M4 medium tanks were a better solution since they were better protected and better armed. Saipan was a vital experience for learning combined arms tactics between the Marines soldiers and their supporting tanks and amtanks. This would prove very valuable in subsequent fighting, especially Iwo Jima and Okinawa.

By the time of the Saipan operation, the use of amtracs was being taken for granted. The Navy had become accustomed to working with them, and had earmarked the LST as the standard mother ship. An LST would normally carry 17 amtracs, along with the Marine companies that would be carried into the landing area. The close proximity of the amtrac crews and Marines during the days before the actual landing helped to ensure a clear understanding of tactics and capabilities of the two units.

Amphibians at Normandy

There was surprisingly little coordination of tactics between the European and Pacific theaters of operation. Although the Army in the Pacific was becoming increasingly well versed in the use of amtracs, the US Army in the ETO showed very little interest in amtracs or Pacific tactics. Army planners in Europe, having conducted large scale amphibious landings in North Africa, Sicily and on the Italian mainland, viewed the Pacific theater as a curious sideshow. Until June 1944, amphibious landings in the Pacific had been on a much smaller scale than in Europe, and so the lessons learned there were discounted. This was a mistake, as until Normandy, there were no amphibious operations in the European theater against a prepared defense like that encountered by the Marines at Tarawa or Kwajelein.

Army planners remained convinced that the landings would be feasible using normal LCVP landing craft. For armored support, they planned to use two versions of the M4 medium tank. The initial wave would be supported by Duplex Drive tanks which were normal M4A1 medium tanks fitted with a special canvas screen for buoyancy and a duplex drive system to power a pair of propellers on the rear of the tank. This British invention would also be used at the British and Canadian landing sites. Later waves would be supported by normal M4 medium tanks landed from LSTs and fitted with deep wading trunks to permit them to drive in to shore from a few hundred yards to sea. Although there were some amtracs available in England, there were no plans to make any significant use of them at Normandy.

In contrast, the DUKW featured quite prominently in all Allied planning for Normandy. DUKWs would begin to go ashore from D-Day on, and would be especially important in the first few days of the landing to provide supplies and transport until the artificial Mulberry harbors could be established. DUKWs would not be used in the contested phase of the landings, but would follow in later waves.

The Normandy landings proceeded as planned at three of the four beaches. However, at Omaha beach in the American sector, the landings were a shambles. The Duplex Drive Sherman tanks swamped or were lost to enemy fire. The infantry had little or no immediate fire support to deal with German bunkers which were particularly well situated since this sector of the beach was backed by rising terrain which overlooked the entire landing area. The US Army infantry units on Omaha beach were able to fight through the German defenses by later in the day with very heavy casualties. The presence of the more sea-worth LVT(A)-1 amtanks could have provided these units with fire support, and the use of amtracs in the initial waves could have positioned the lead waves against the protected sea-walls without having to run the gantlet of German machine gun fire.

If the failure to use amtracs was a missed opportunity, the DUKWs certainly lived up to expectations. The DUKWs could be used more easily than LSTs and LCIs for the first few days since they could more easily maneuver around remaining beach obstructions. They proved especially valuable in the second week of the Normandy operation after a major Channel storm wrecked many of the artificial Mulberry harbors. In the first four months of the operations in France, DUKWs handled 40% of the overland cargo. Their importance only diminished once normal harbors such as Cherbourg and Antwerp were secured and cleaned up.

Interest in amphibian vehicles revived in the autumn of 1944 when Allied planners in Europe began to consider operations in Germany itself. The most worrisome natural obstacles were the great rivers, especially the Rhine. After the fiasco at Omaha, there was less reluctance to consider tactics and technology developed in the Pacific. The Army began having amtracs moved to the ETO for possible river crossing operations. The British 79th Armoured Division, known as "Hobart's Funnies", was already adept at the use of specialized vehicles and began using amtracs for operations in the water-logged terrain of the Benelux coast where the British 21st Army Group was operating. The 79th Armoured Division pioneered the use of the LVT-2 and LVT-4 in British service, during operations in Belgium, the Netherlands and northern Germany. The first major use was during the operations to clear the Scheldt estuary in October 1944 in order to clear the approaches to Antwerp harbor. The amtracs, known as "Buffaloes" to the British, played a useful role in the fighting in this difficult, water-logged terrain. A total of 853 amtracs were supplied via Lend-Lease, almost all to Britain. These included 200 LVT-1, 100 LVT-2, and 503 LVT-4.

Ultimately, the surprise capture of the bridge at Remagen by the 9th Armored Division removed the need for a bloody amphibious crossing operation of the Rhine. Nevertheless, equipment hoarded for the operation, including DD tanks and amtracs, were used in the final months of the war for rivers crossings at various locations in Germany and Holland.

Amtracs were also used in modest numbers in Italy in the final months of the war. In this theater, the British called them "Fantails". In early April 1945, the British Eighth Army staged an amphibious assault across the Comacchio lagoon during their attack along the Adriatic coast, using LVT-4s. The US Army's 755th Tank Battalion was also converted to amtracs for the final phase of operations in northern Italy.

Pacific Finale

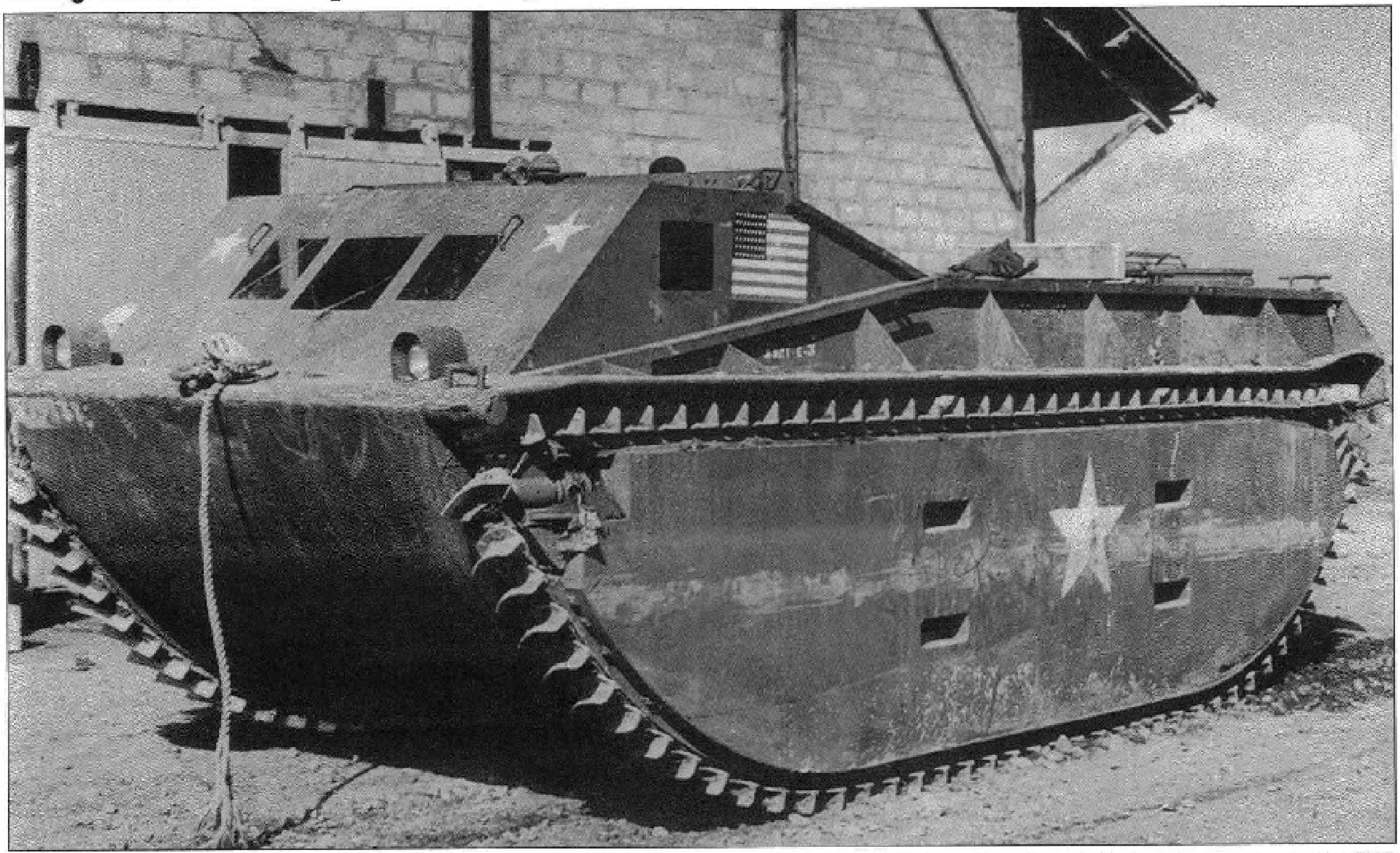
Iwo Jima represented a display of the many lessons learned by the Marines during the Pacific campaign. Amtanks formed the initial wave of the attack followed by wave after wave of amtracs. In total, some 68 amtanks and 380 amtracs were used at Iwo Jima. The Marines avoided the problems discovered at Saipan when using amtanks inland. Although some LVT(A)-4 amtanks were used beyond the beach, the Marines landed much larger numbers of M4A2 medium tanks than in previous operations in order to provide the needed close fire support. Iwo Jima was a very costly battle due to the tenacious Japanese defense, but by this stage, the Marines had a clear understanding of the technology and tactics of amphibious attack.

The largest single amphibious operation of the Pacific war took place on 1 April 1945 with the invasion of Okinawa. This was a combined Army/Marine effort and a total of 290 amtanks and 872 amtracs were involved in the landing operations. A total of four divisions were put ashore on the main beaches, and additional units were used to attack neighboring islands. As on Iwo Jima, the use of amtanks trailed off after the initial landings, and the burden of close support fell to the regular tank battalions. However, the amtracs continued to play a vital role. In May 1945, when the rains turned much of the road network into a river of mud, it was the amtracs which provided the key in keeping Army and Marine units supplied.

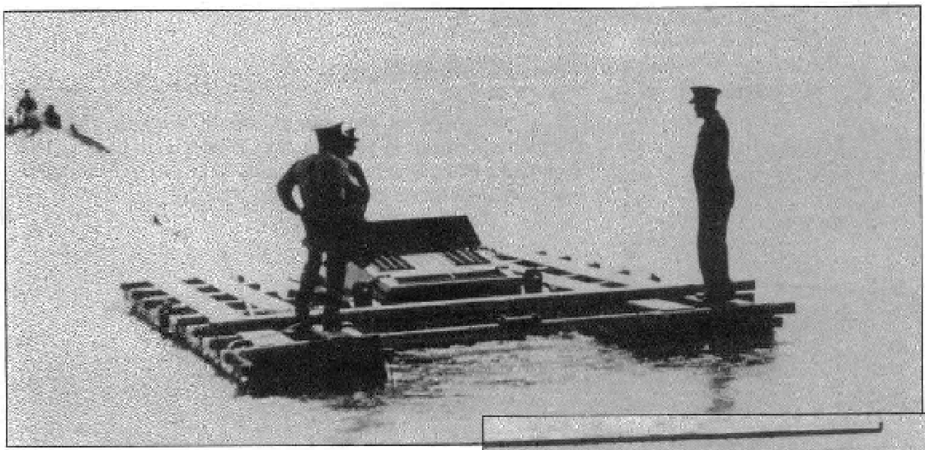
Authors Notes

All photos in this book unless otherwise noted came from official US sources. The principal sources were the photographic collections of the US Marine Corps historical branch, and the US Navy collection at the US National Archives. US Army photos came from the US Army Signal Corps collection formerly at the Pentagon and later at DAVA, Anacostia Navy Yard, and now at the US National Archives (USNA), College Park, and from the Military History Institute at Carlisle barracks, and the Patton Museum at Ft. Knox.

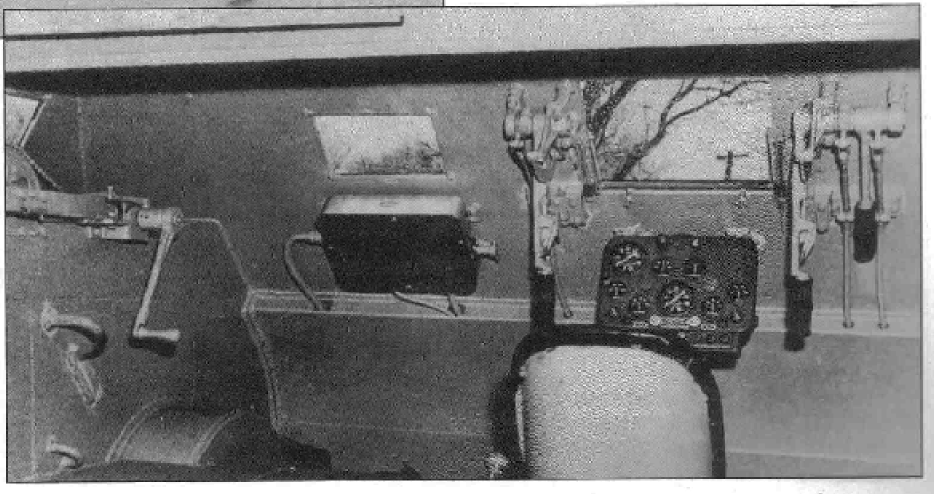
Early Amtrac Development and Operations 1939-43



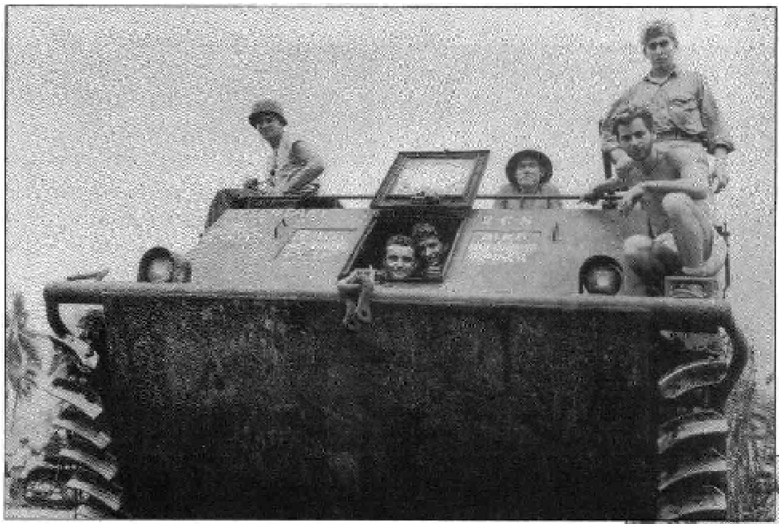
The first operational use of the amtrac in the Mediterranean theater occurred in November 1942. A small number of LVT-1 amtracs were used by FMF Atlantic during the landings on the coast of North Africa during Operation Torch. They were used only for the transport of supplies, and not in an offensive role. This is a LVT-1 at Fedala in Morocco on 4 December 1942. (US Navy)



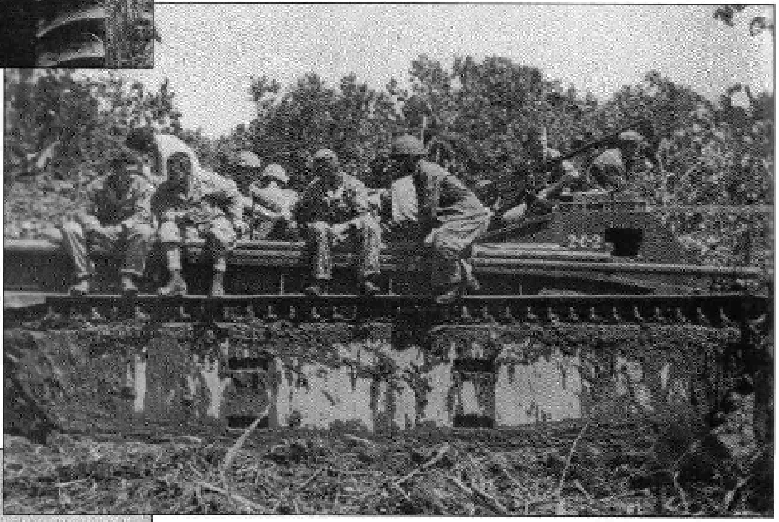
The Marine Corps began experiments with the use of armored vehicles for assault landings before the war. This was one of their more curious experiments, an attempt to lash pontoons on the side of a Marmon Herrington light tank. This was not entirely successful, and the project ended in 1939. (Patton Museum)



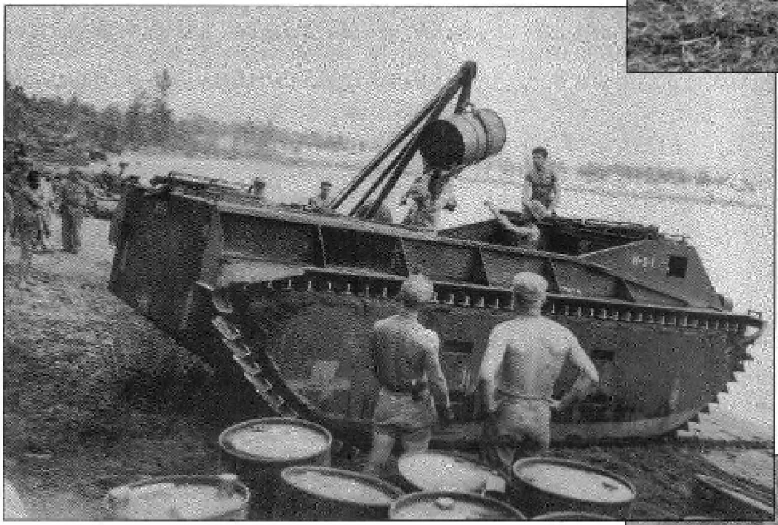
This is an interior view of the driver's station in a LVT-1. The controls were essentially similar to those of a light tank. These early vehicles had no armor and so were very vulnerable to enemy machine gun fire. (Patton Museum)



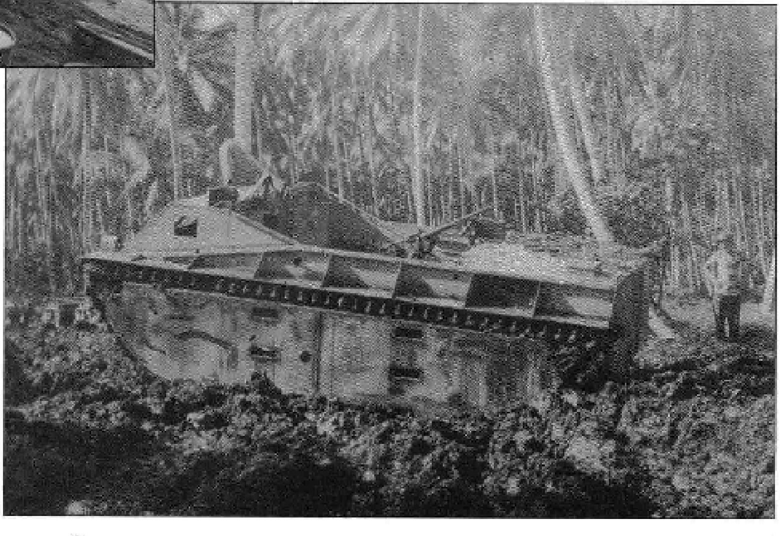
The first large scale use of amtracs occurred during the Guadalcanal campaign. The Marine's 1st and 2nd Amphibian Tractor Battalions landed after the main Marine assault to provide supplies and ammunition. The amtracs were used throughout the Solomons campaign, primarily for moving supplies in the tough jungle terrain. This LVT-1, probably from the 2nd Amphibian Tractor Battalion, carries the name and slogan "Dysentery-She's Always Runnin'. (USMC)



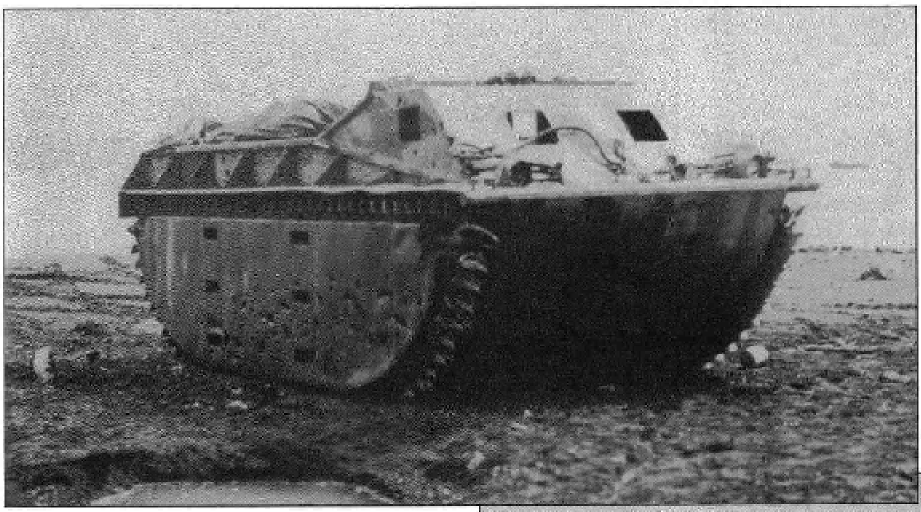
This photo clearly illustrates the reason why the Marines left many of their trucks behind, but brought all their amtracs with them to the Solomons. The jungle terrain was impassible to trucks, but the amtracs could be used in many locations. Although the amtracs were seldom used in a combat role during the Solomons campaign, experience with the amtracs prompted them to change tactics by the time of the Gilberts offensive later in 1943. (USMC)



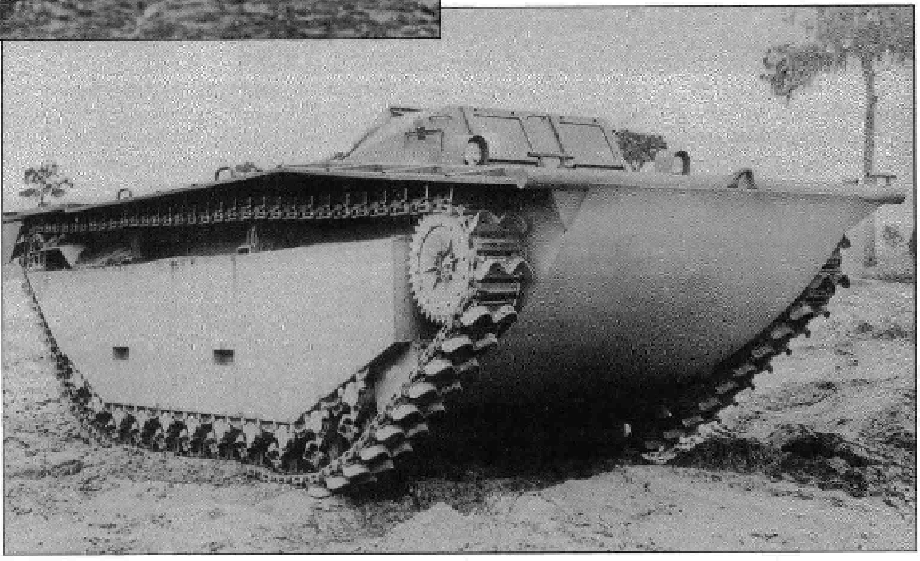
A good view of the typical use of amtracs during the Solomons campaign in 1942-43. The amtracs were used primarily to carry supplies, whether from ship-to-shore, or from the shoreline to other locations in the islands. (USMC)



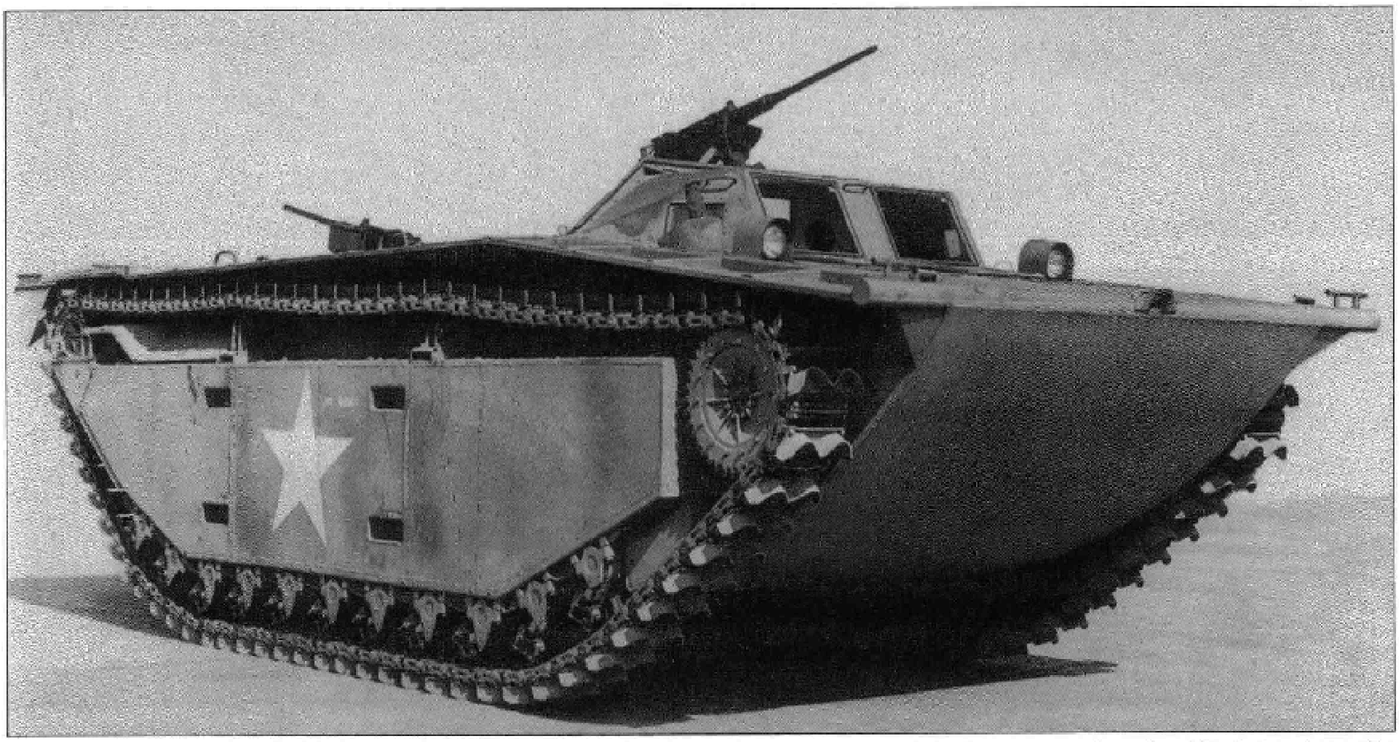
In June 1943, the Marines moved up the Solomons chain and in July 1943 attacked Rendova. Once again, the amtracs proved invaluable in supporting the troops once ashore due to the soggy ground conditions. (USMC)



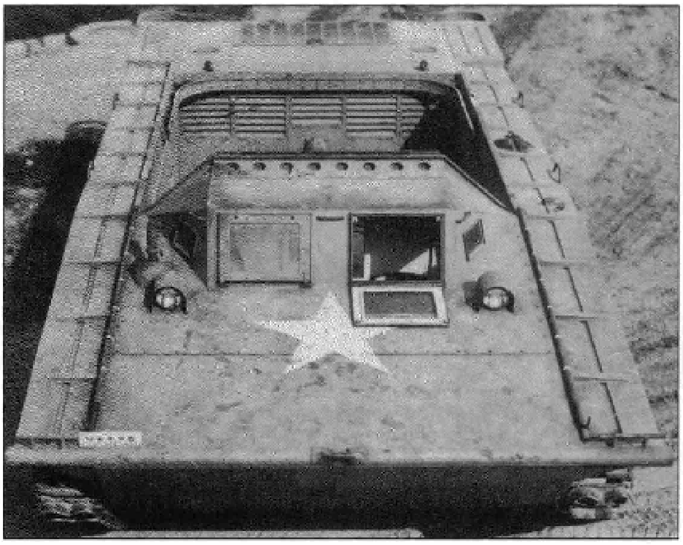
The amtracs were not well protected enough for combat on land as this photo proves. An artillery round or mortar bombs landed near this amtrac as can be seen from the crater. The explosion lacerated the side of the amtrac's pontoon with metal fragments, tearing many holes in the side. (USMC)



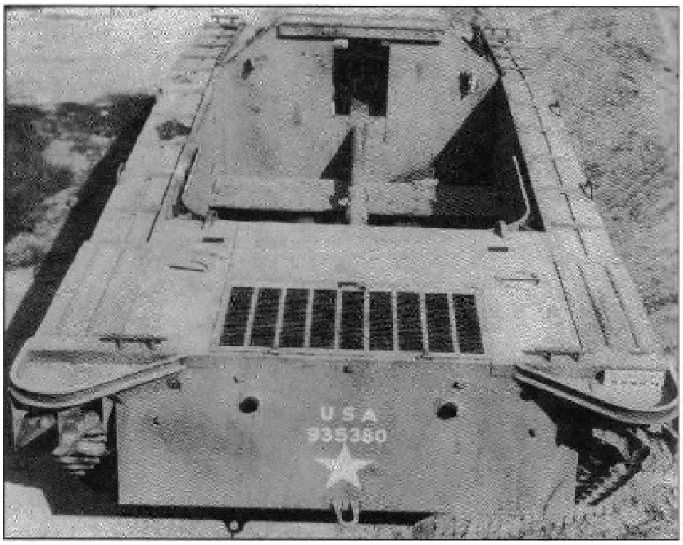
The LVT-1 was far from a mature design from an engineering standpoint, and the LVT-2 quickly followed. This type would become the workhorse of the Marine Corps and Army through most of the Pacific campaign. (Patton Museum)



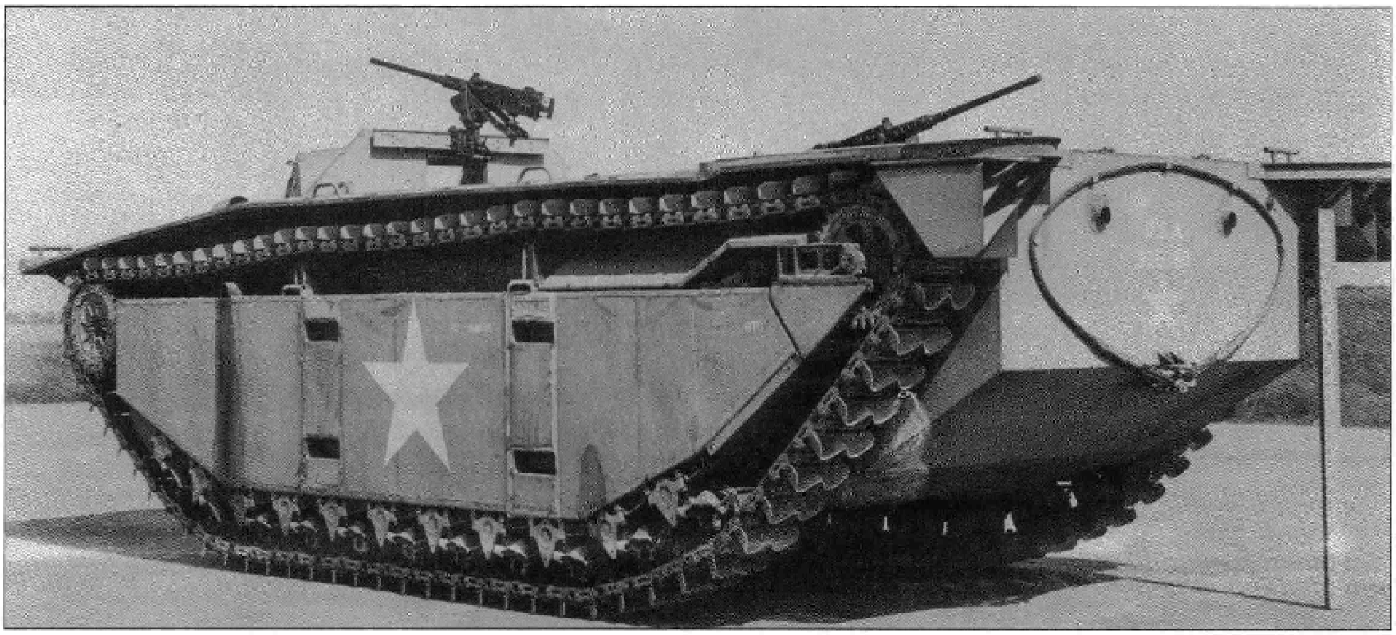
The basic version of the LVT-2, like the LVT-1, was unarmored since it was originally intended only for the transport of supplies. The design changed in many small details during production, such as the number of steps in the side pontoon. This particular view is of an Army LVT-2. The Marine Corps did not usually use the white star on its vehicles. (Patton Museum)



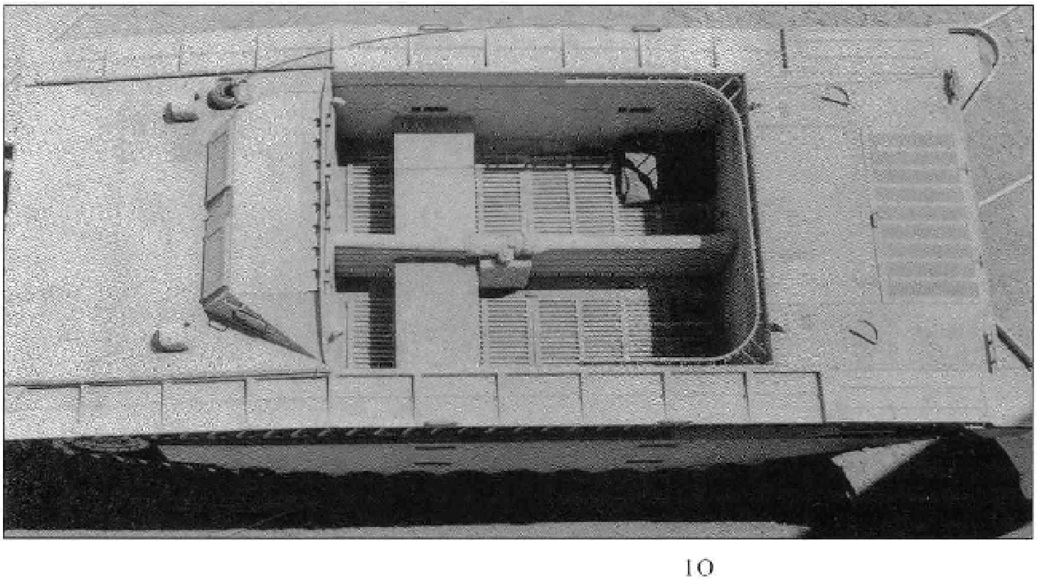
This overhead front view of an LVT-2 shows one of the characteristic features of this version: the two large windows in the front of the driver's compartment. A view back into the cargo bay also shows the louvered vents leading into the engine compartment. (Patton Museum)



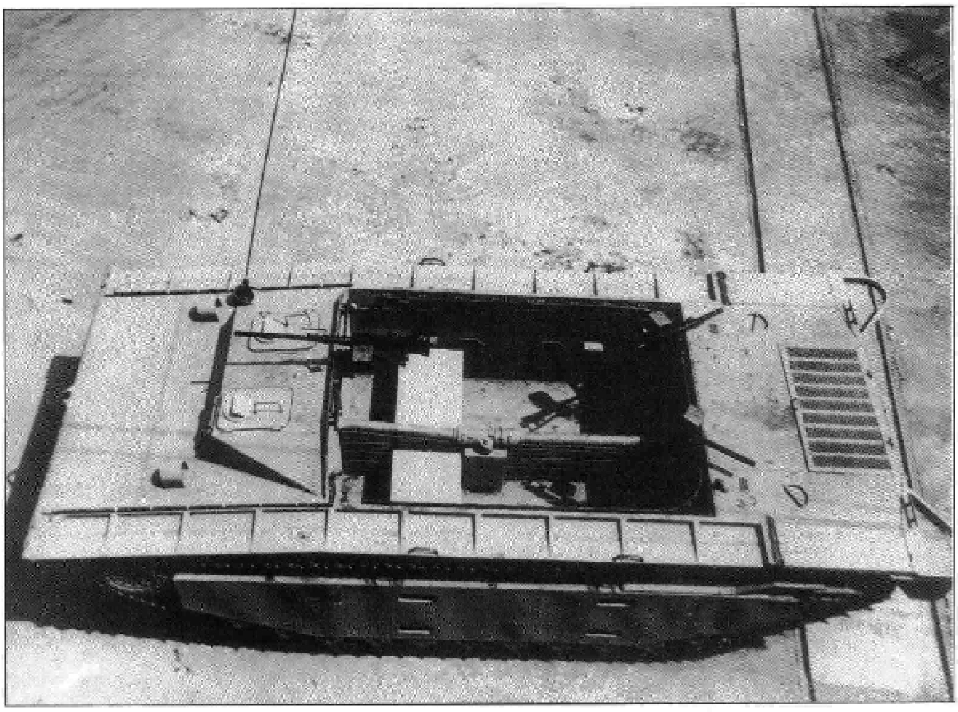
Another view of an Army LVT-2 provides a good view of the bulkhead separating the driver's compartment from the cargo bay. A drive-shaft bisected the cargo bay since the vehicle transmission was located in the bow. (Patton Museum)



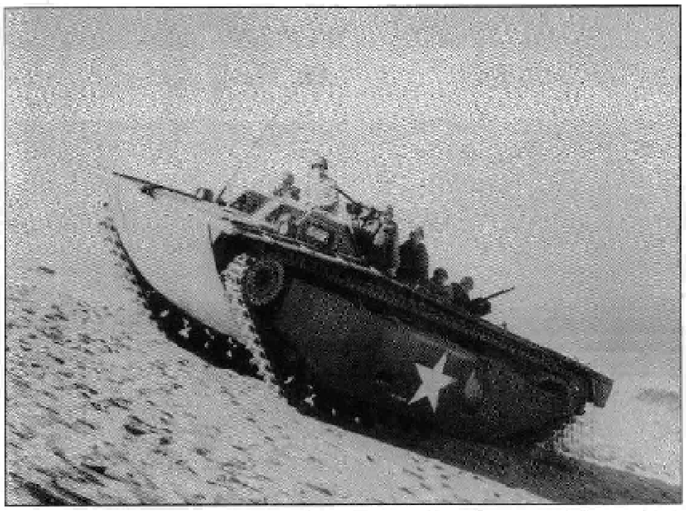
This rearview of an Army LVT-2 provides a good view of the basic configuration of the rear hull. The louvers behind the tracks were designed to direct the water flow off the tracks when the amtrac was swimming. (Patton Museum)



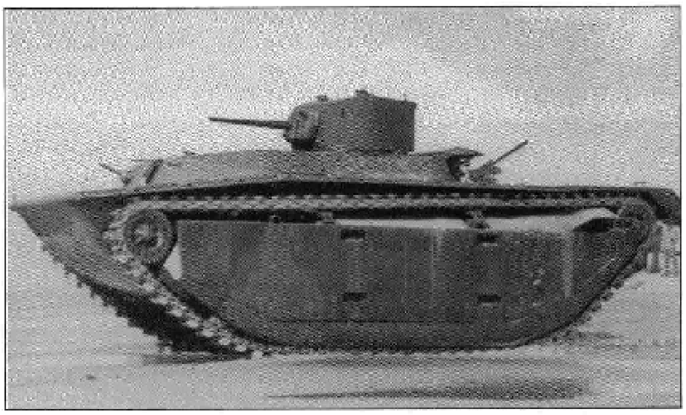
An overview of a Marine LVT-2 provides a good view of the interior of the amtrac. The slatted floor was intended to provide sure footing when the floor area was wet. (US Navy)



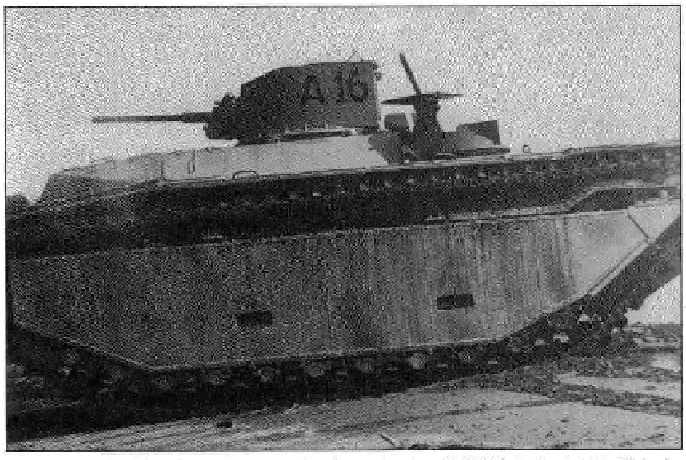
This overview of the armored LVT(A)-2 points out some of the differences between the basic LVT-2, and the armored LVT(A)-2. Note that the driver's compartment is lower and flatter, has two hatches with periscopes, and lacks the large front windows of the unarmored model. This is the standard production type with the louvered engine air intake at the rear. On the late production vehicles, this was replaced by a cover with four mushroom covers to better keep out surf. (FMC)



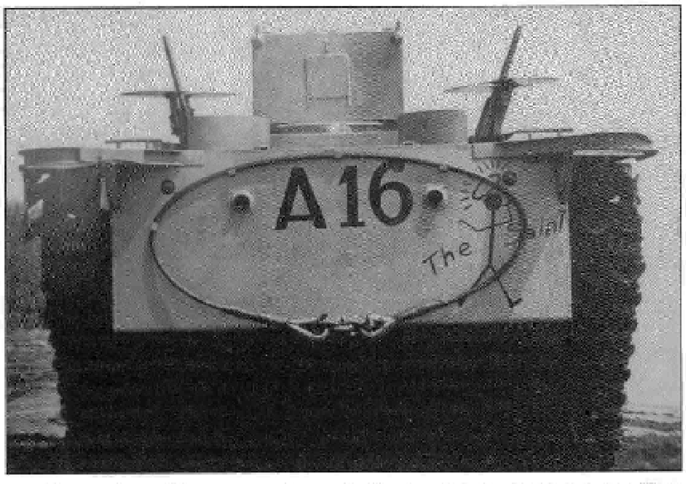
A LVT-2 of the 543rd Amphibian Tractor Battalion on training at Fort Ord, California on 26 November 1943. This is clearly distinguishable as the unarmored version by the presence of the large windows on the bow.



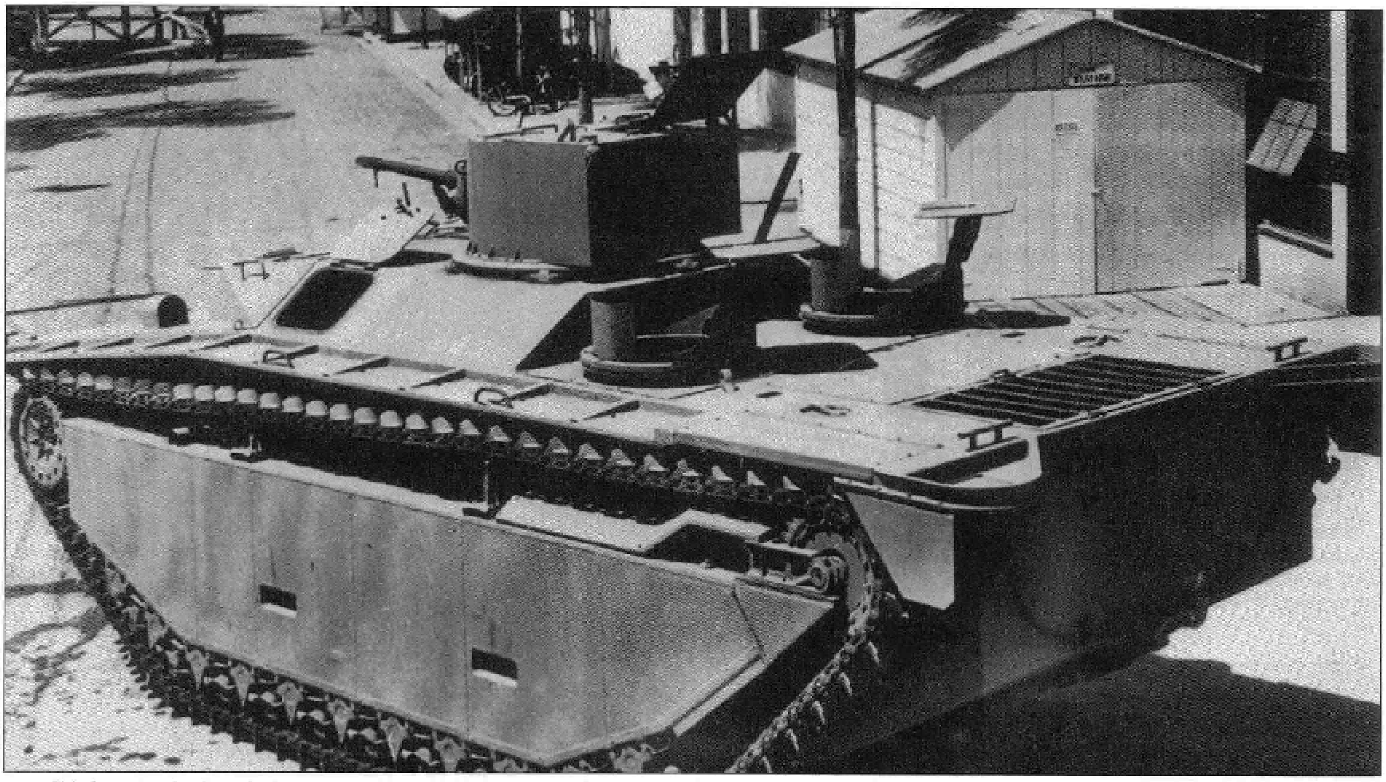
Development of an armed version of the amtrac began in 1941 and consisted of a light tank turret on an armored version of the LVT-2 hull. The turret was basically similar to that used on the M3A3 or M5A1 light tank, except that it lacked the rear turret bustle for the radio. This is an early LVT(A)-1 which lacked the armor collar around the .30 cal machine gun stations. This type of amphibian was usually called an amtank, to distinguish it from the supply carrying amtracs. (US Navy)



A good side view of a standard production LVT(A)-1, in 1943. This is the standard production version, with an armored collar around the rear machine gun stations, and an armored shield. (US Navy)

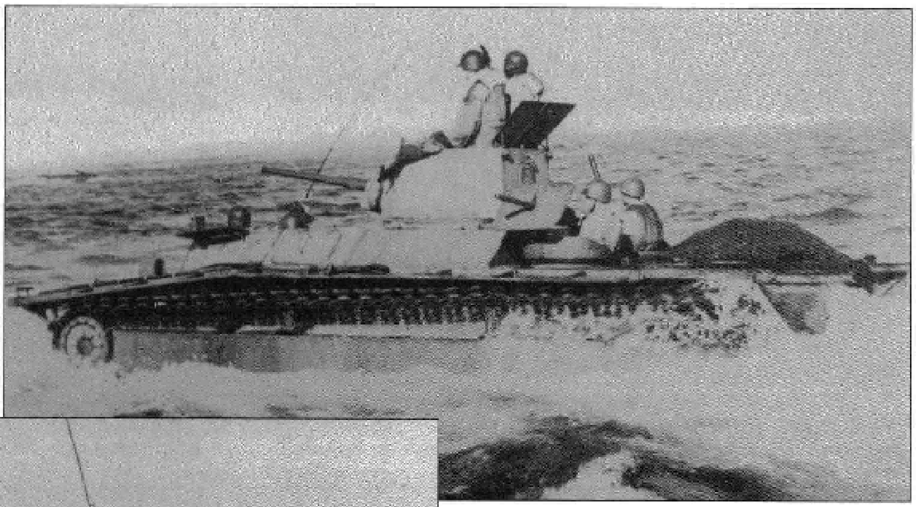


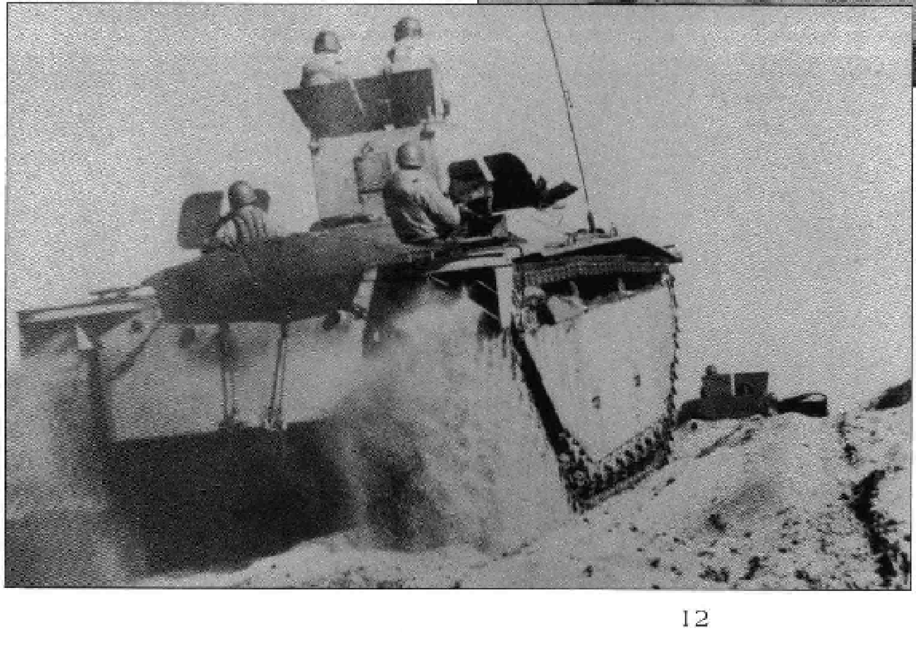
A rearview of the same vehicle, A-16, showing the vehicle name "The Saint" after the popular crime novel series.



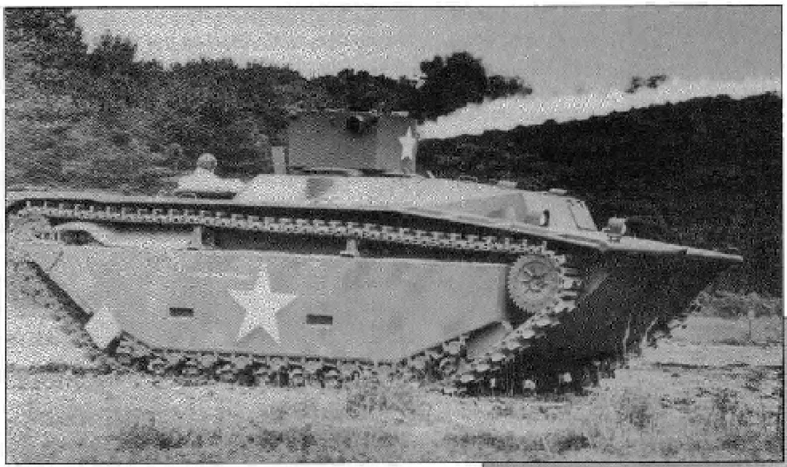
This is a standard production model of the LVT(A)-1, which clearly show the two ring mounts for .30 cal Browning machine guns behind the turret, This vehicle is being driven out of the main FMC production facility in California. (FMC)

A LVT(A)-1 in the water. The amtank was propelled in the water by using its tracks which were fitted with large paddles to propel the water. Amtracs and amtanks often were fitted with a canvas cover over the louvered engine cover to prevent too much water seeping in. (US Navy)

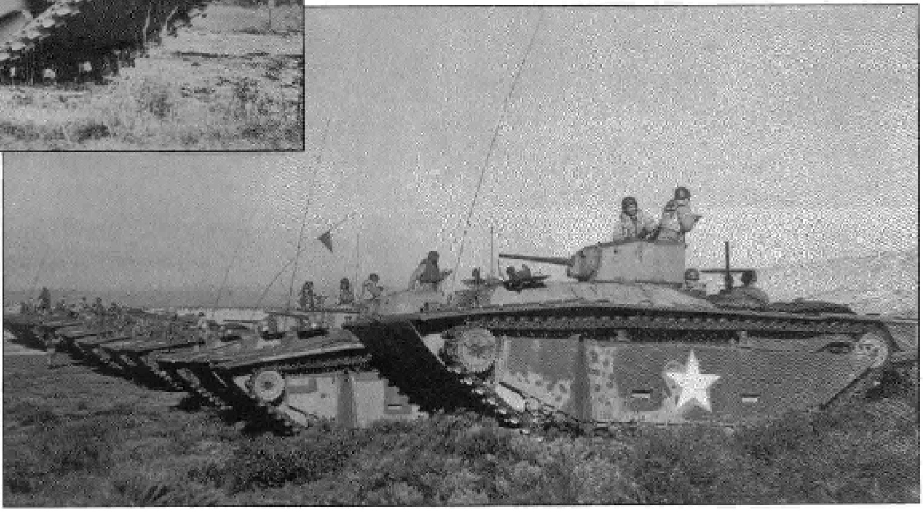




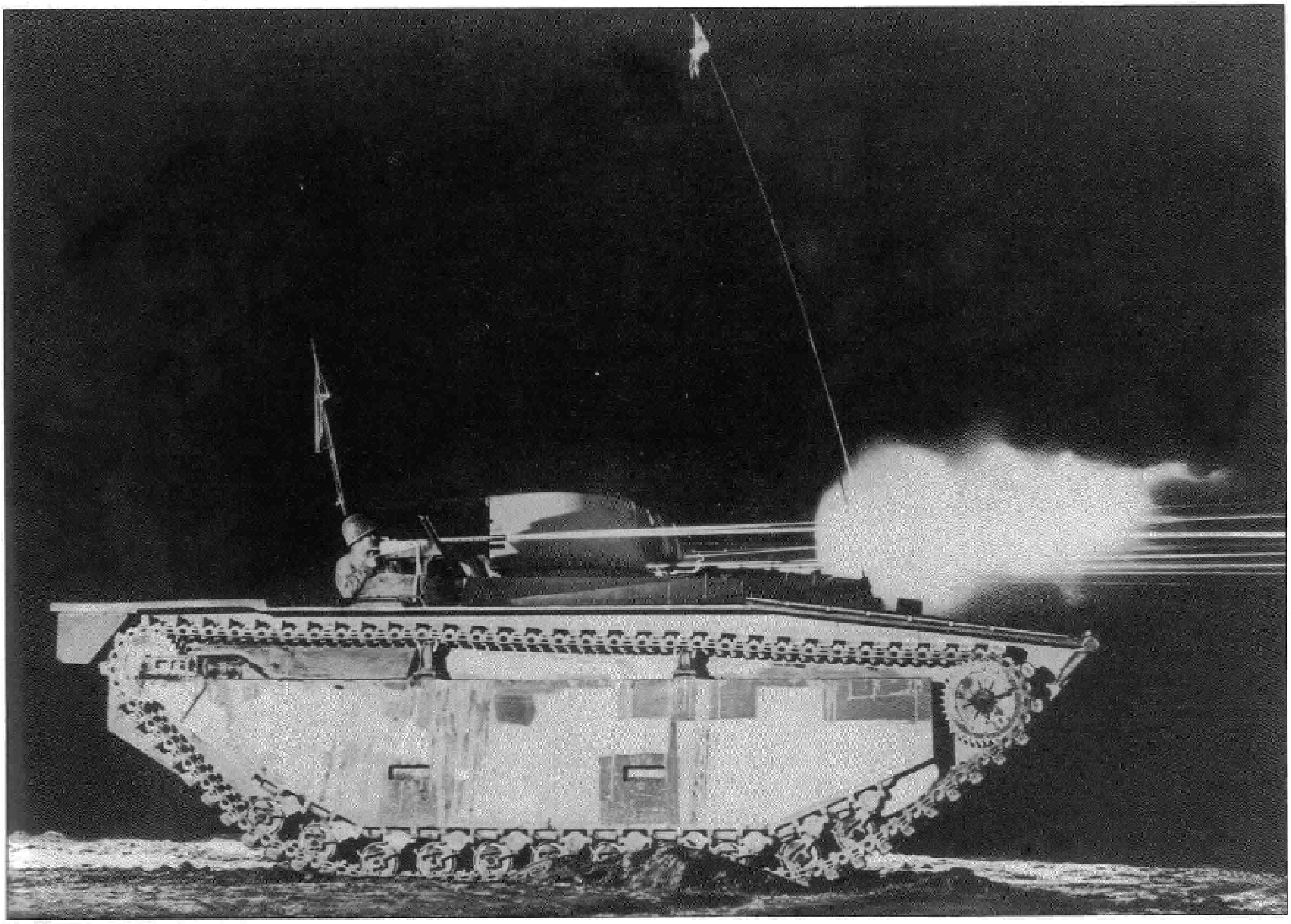
A pair of LVT(A)-1 amtanks during training exercises on the California coast in 1943. This provides another view of the canvas cover over the engine deck, and the two rear machine gun stations. (US Navy)



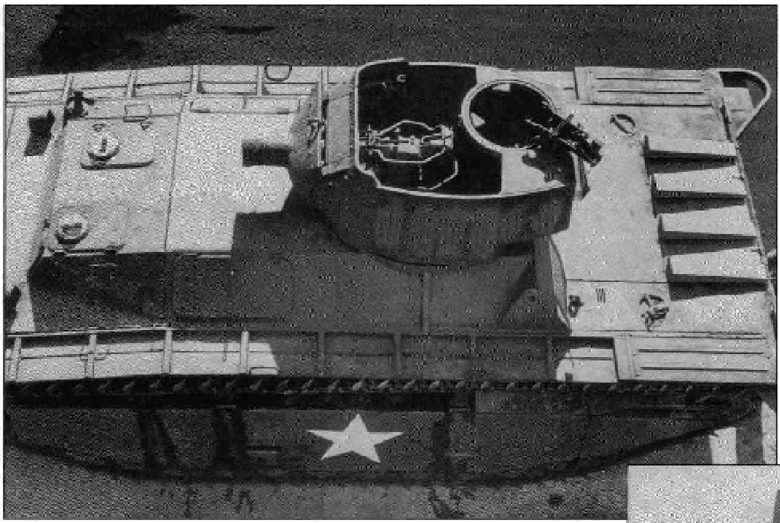
Combat experiences in the Pacific against Japanese bunkers led to some interest in fitting the LVT(A)-1 with a flamethrower instead of a gun. This is an experimental version tested in the US. However, this idea was eventually rejected, and flamethrowing tanks used instead, since the amtank was too lightly armored to stand up to sustained fire from a bunker. (Patton Museum)



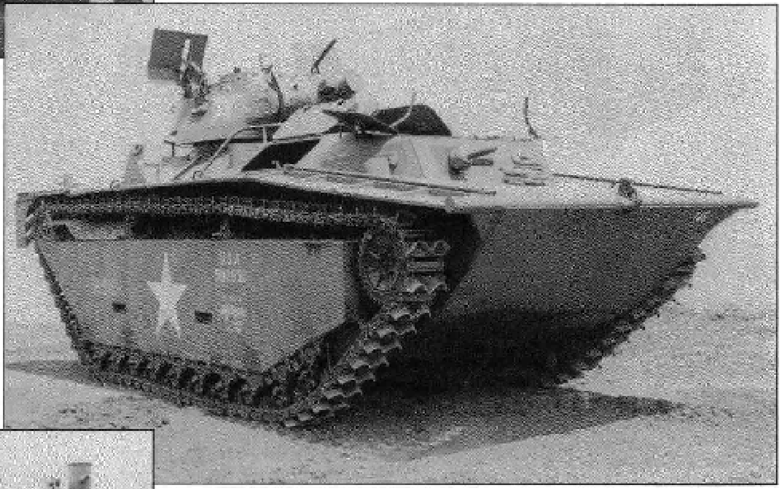
Although the amtrac is usually associated with the US Marines, the US Army also made extensive use of them. This is a US Army LVT(A)-1 amtank unit during training in the United States, at Fort Ord, California, in 1943. (FMC)



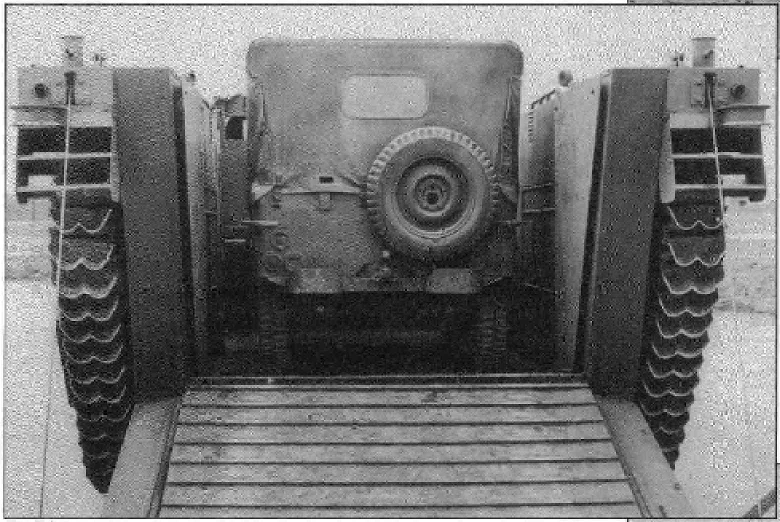
An impressive display of firepower as a LVT(A)-1 fires all of its guns on a nighttime training exercise. (US National Archives)



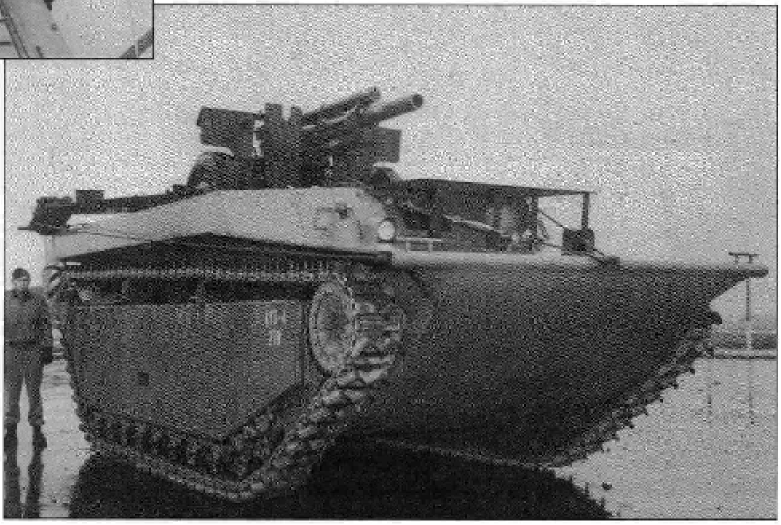
The LVT(A)-1 did not have sufficient firepower, and so was replaced by the LVT(A)-4. This amtank used the turret from the M8 75mm howitzer motor carriage. This is one of the prototypes which has an actual M8 turret, complete with the remnants of the grouser stowage racks on the turret side. This overhead view also provides a good view of the four vent covers added late in the LVT-2/LVT(A)-1 production run to keep water out of the engine compartment. (US Army)



The culmination of amtank development during World War II was the LVT(A)-5. This was derived from the LVT(A)-4 but had a number of improvements including a stabilization system for the gun, and a more extensive selection of armored visors. It did not see any extensive combat use in World War II. (Patton Museum)

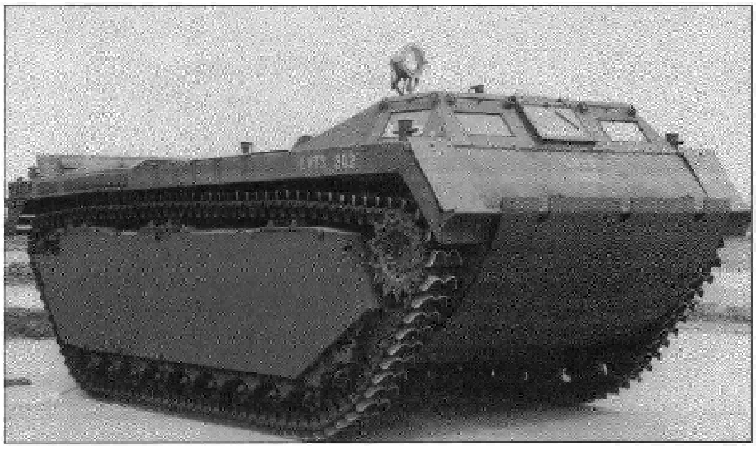


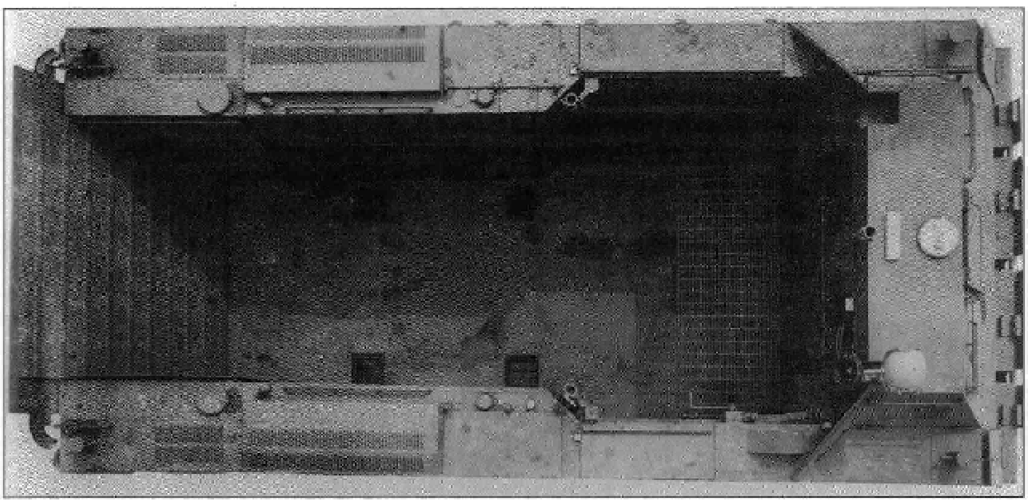
One of the problems of the LVT-2 family was the use of a well for carrying cargo. This made it difficult to carry large loads. Borg Warner developed a competitor, the LVT-3 Bushmaster, which had a drop ramp to enable it to carry larger loads like this jeep here. (Patton Museum)



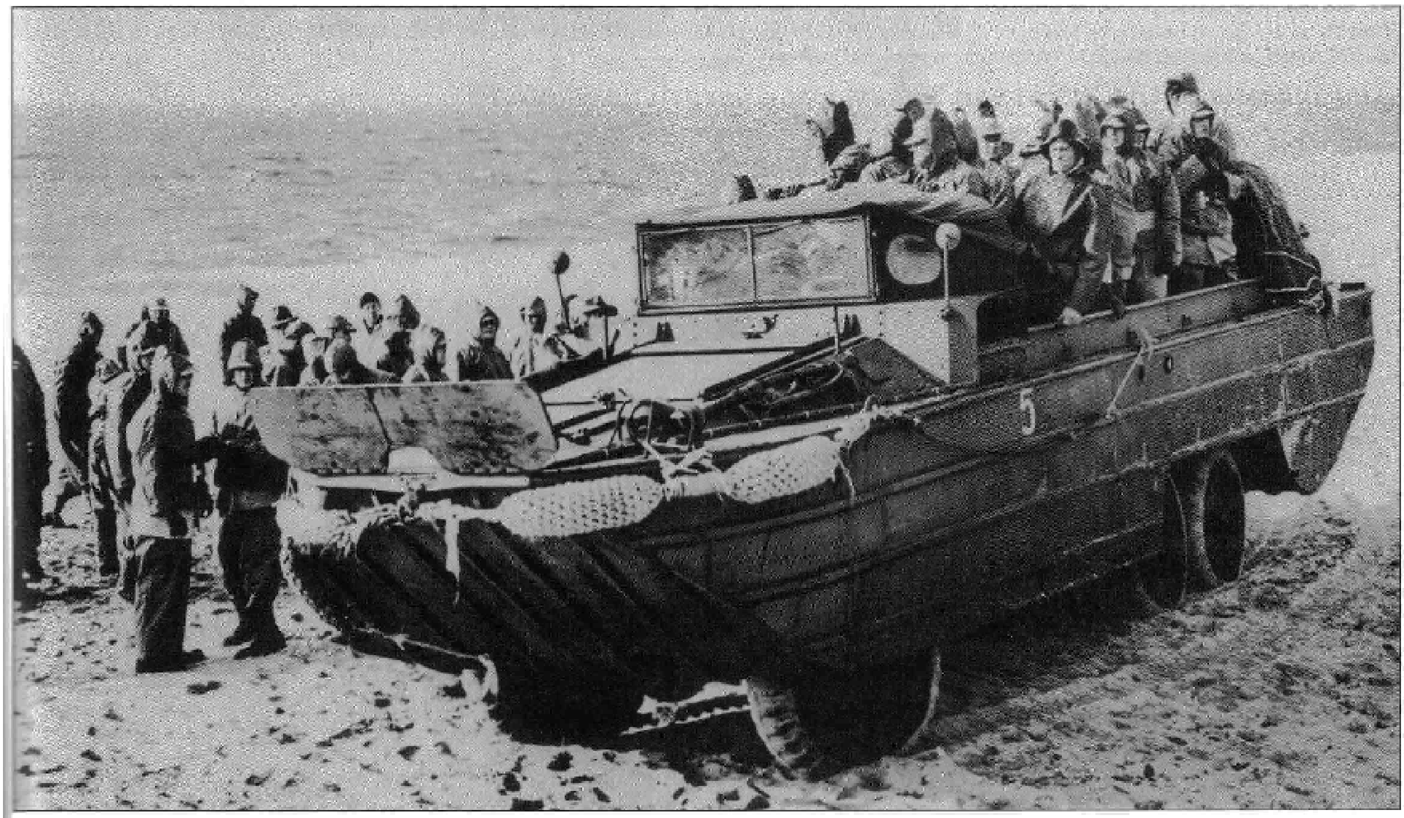
There were a number of experiments to permit amtracs to carry and fire artillery weapons on the way into the beach. This is a LVT-4 fitted with a 105mm howitzer. A blast shield has been erected over the driver's compartment. This was not actually used in combat. (Patton Museum)

In parallel to FMC Corporation's LVT-2 series, Borg Warner developed its own amtrac, which emerged in March 1944 as the LVT-3 Bushmaster. Like the LVT-4, it used a large rear ramp to permit better access to the cargo area. (Patton Museum)

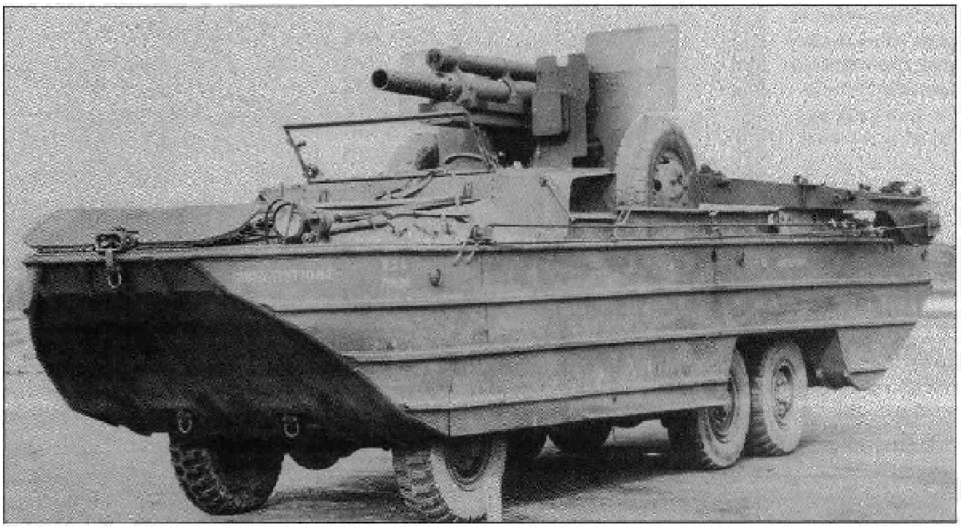




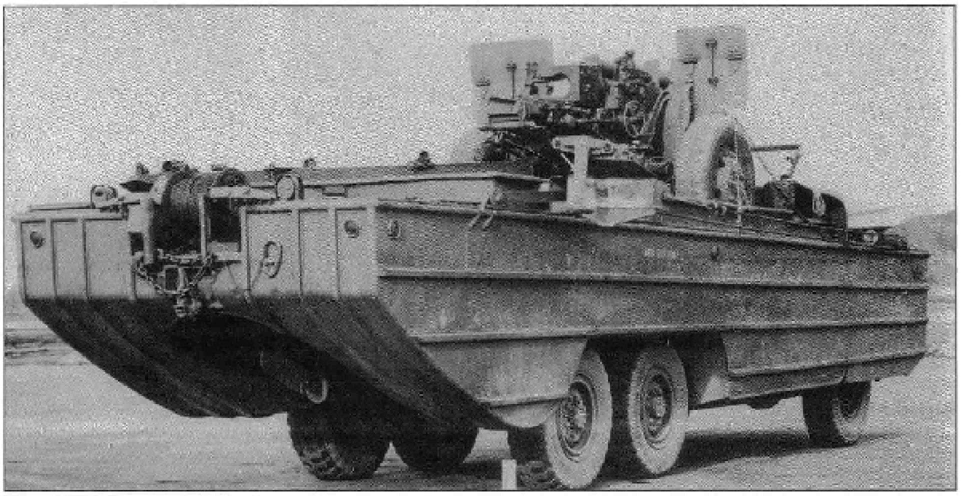
Although production of the LVT-2 family was well underway, the Marine Corps favored production of the LVT-3 Bushmaster since it offered a number of improvements over the LVT-2 family. This overhead view shows the spacious cargo bay of the Bushmaster. This vehicle had the engines mounted in the side sponsons to maximize the amount of cargo space in the vehicle. (Patton Museum)



Besides the amtrac, during World War II the US also developed the DUKW. This was an amphibious version of the standard GMC 2 1/2 ton truck. The first prototype was completed in the late spring of 1942, and it went into production later that year. This is a stateside training exercise. (MHI)

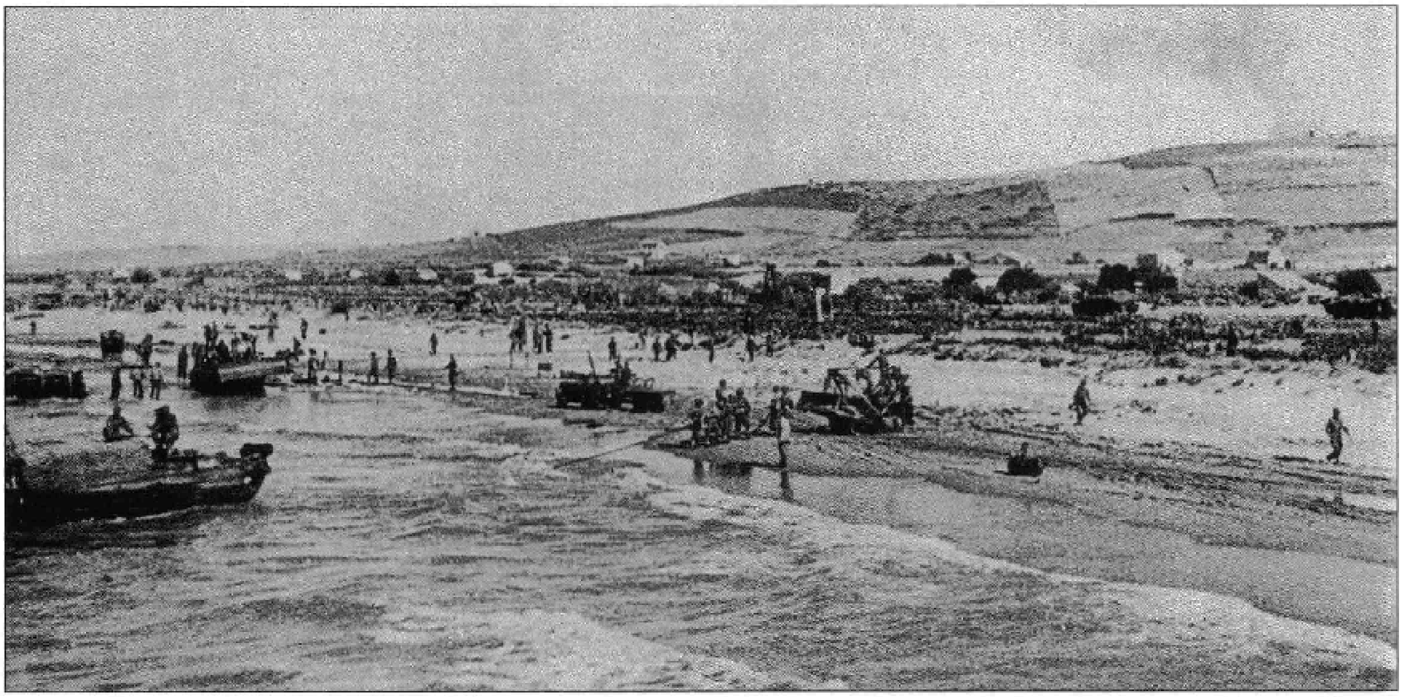


Since artillery could not be towed through the water, efforts were made to carry them in DUKWs. This is a DUKW that was being tested at Aberdeen Proving Grounds to determine whether it was same to carry the 105mm howitzer in the DUKW in water. The tests were successful. (Patton Museum)

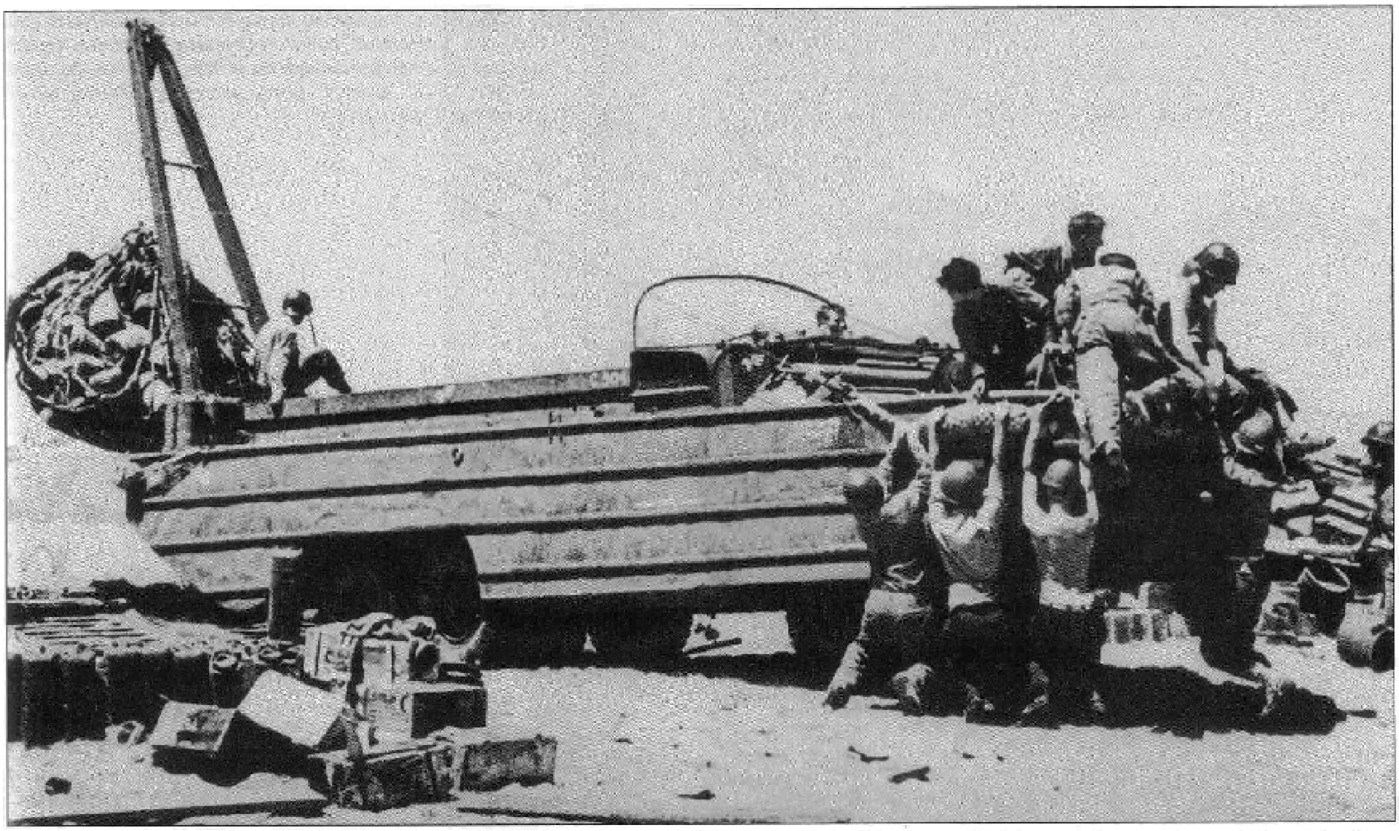


A rear view of the Army DUKW with a 105mm howitzer on board. This combination proved successful and was widely used in the European theater for moving howitzers from ship to shore, and also across rivers. (Patton Museum)

Amphibians in the European Theater of Operations 1943-45

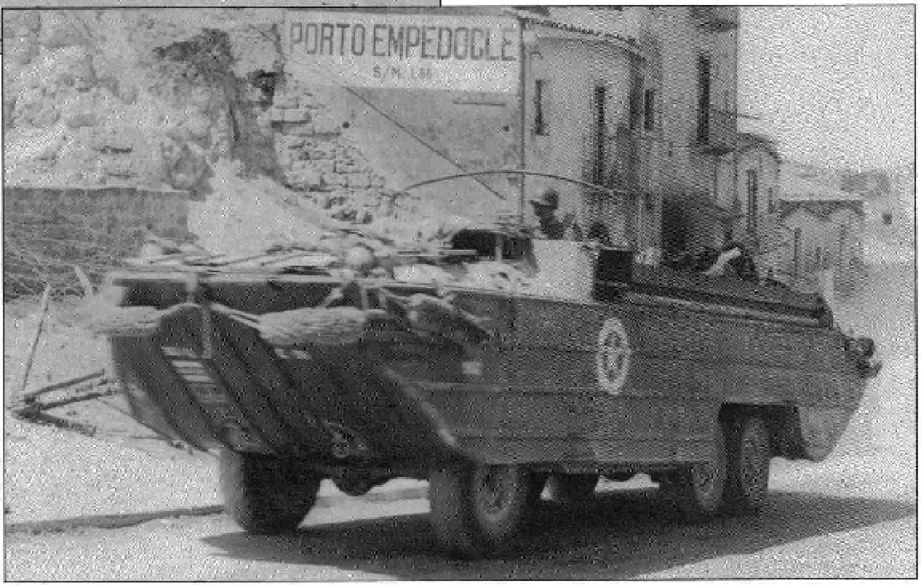


The DUKW was first used in large numbers during Operation Husky, the Allied landings on Sicily in July 1943. This is an overview of the main US Army landing site at Licata, and a DUKW can be seen approaching from the left. (MHI)

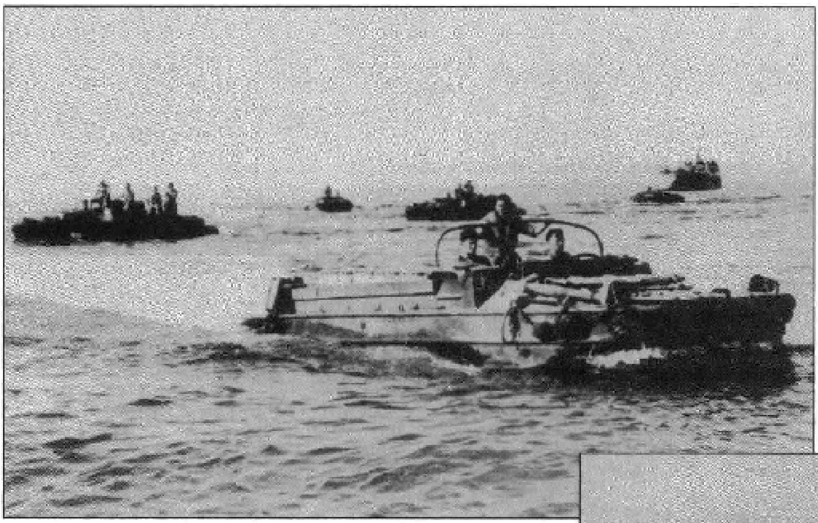


During the Sicilian operations, a number of DUKWs were fitted with an A frame crane for lifting cargo. In this case, the crew has picket up a load too heavy for the vehicle and are frantically trying to keep the vehicle level until the load can be lowered. (MHI)

Besides being used by US forces on Sicily, the DUKW was also provided to Britain through Lend Lease. This is a British DUKW unit coming ashore at Messina in Sicily during the late phases of Operation Husky. (MHI)

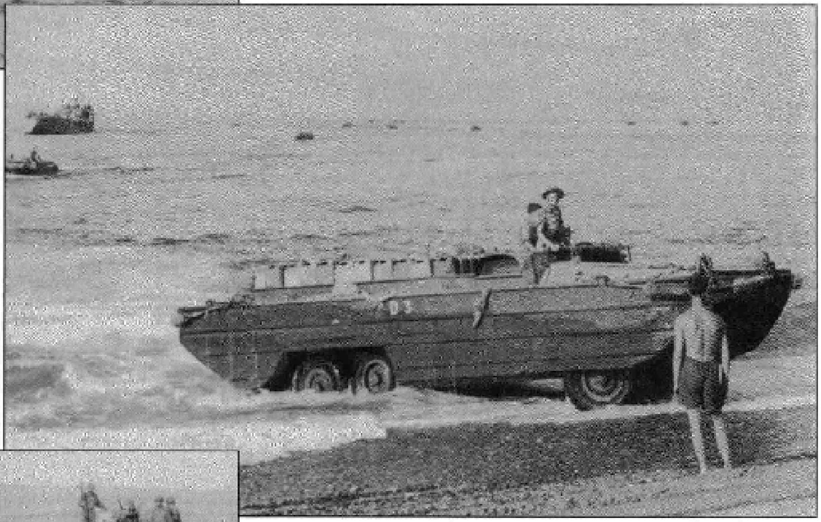


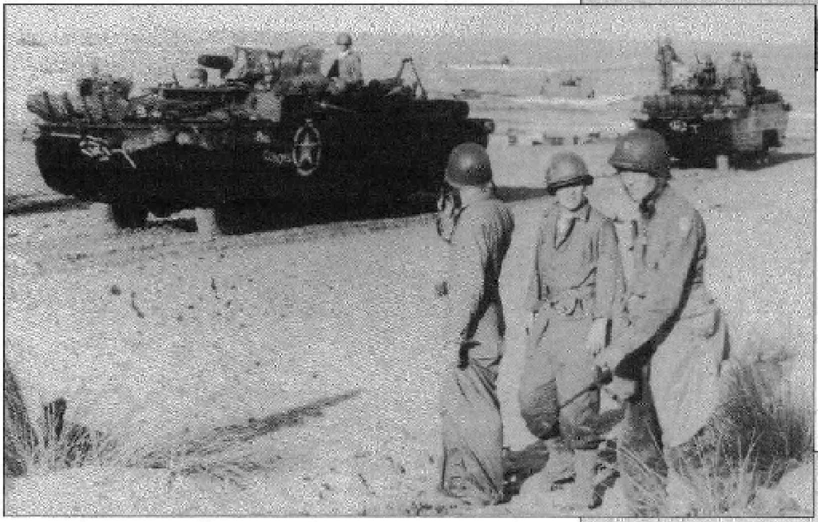
A US Army DUKW passes through Porto Empedocle on 25 July 1943. It carries the circled star, which was the standard US Army identification marking for the Sicily operation. Less visible on the lower bow is the colored bar code, a system of coded markings used to identify units during amphibious operations. (MHI)



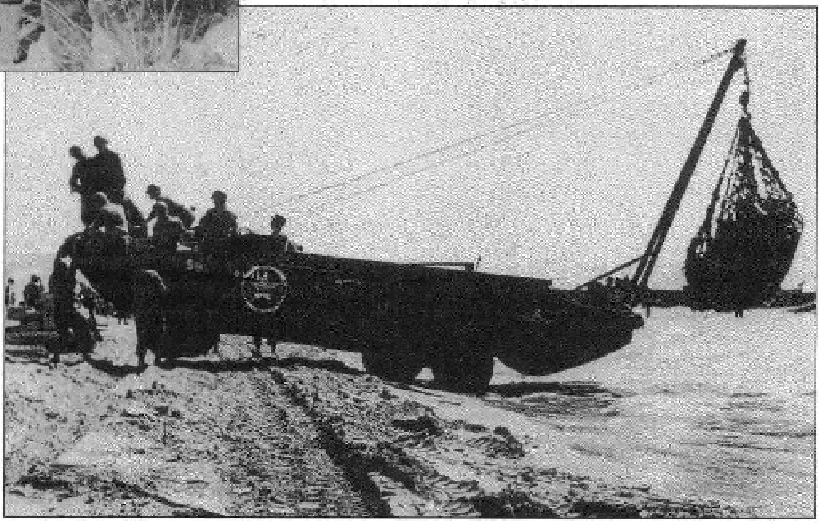
The use of the DUKW during the Sicily operations had been so successful that they became standard on all subsequent amphibious landings in Italy. This is a group of DUKWs full of jerricans going ashore at Salerno on 4 September 1943. (MHI)

A British DUKW filled with jerricans comes ashore near Gallico Marina on 4 September 1943 during the Salerno landings. (MHI)





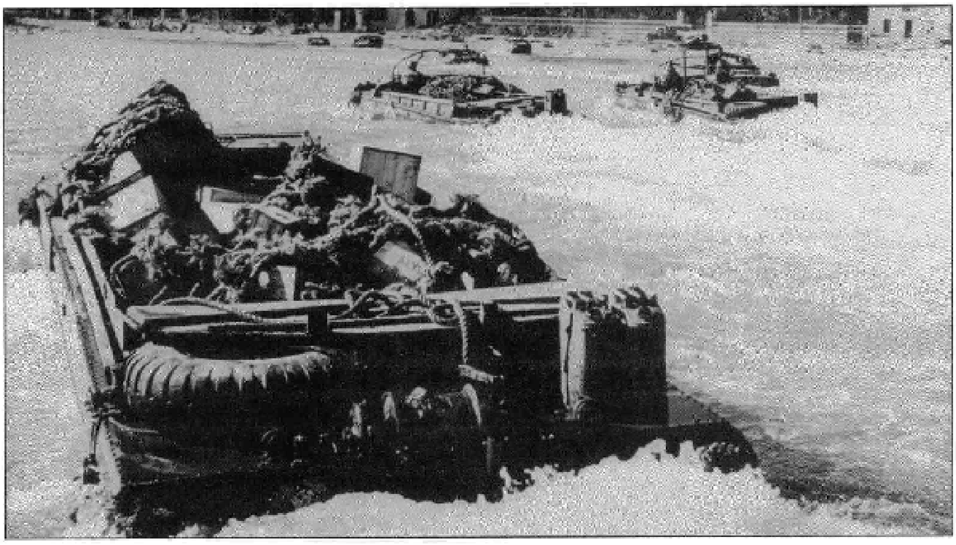
A DUKW supporting the 143rd Regimental Combat Team lands in Italy on 9 September 1943 during the Salerno operation. This unit is bringing a 105mm howitzer battery ashore. The howitzers could then be unloaded using skids carried inside the DUKW. (MHI)

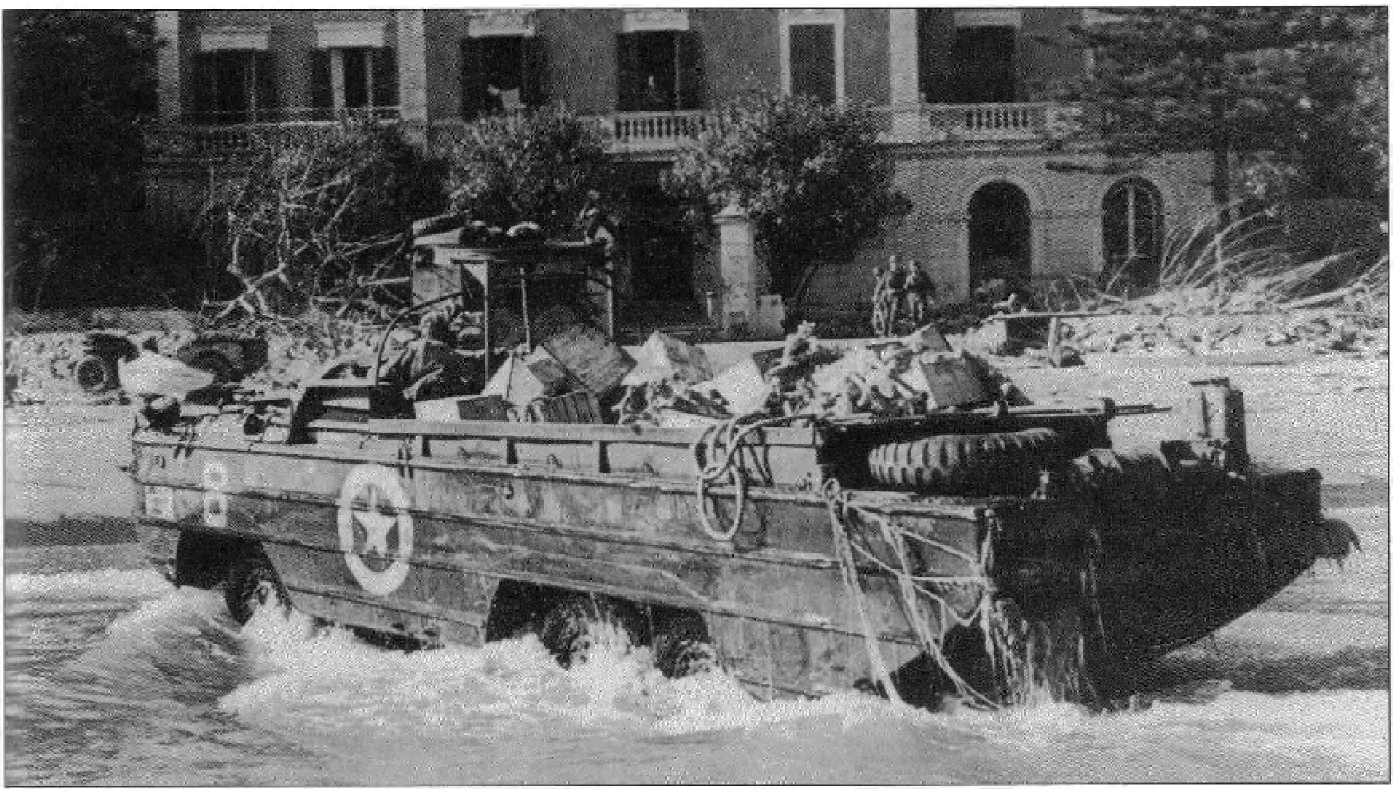


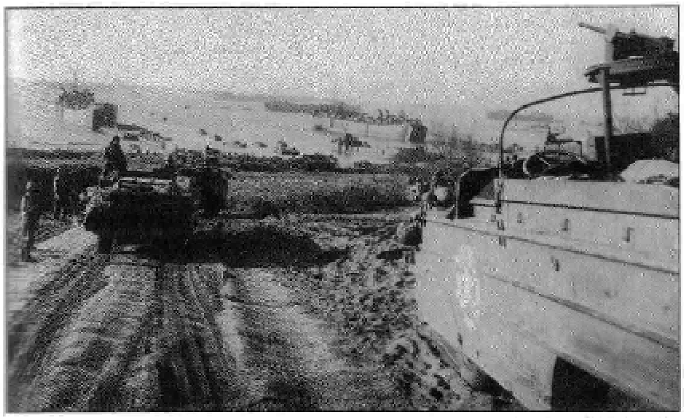
Another example of a DUKW with a rear mounted crane for lifting loads, this time during the Salerno operation on 9 September 1943. (MHI)

The next major amphibious landing during the Italian campaign was at Anzio. Here a trio of DUKWs go ashore on 2 November 1943. (MHI)

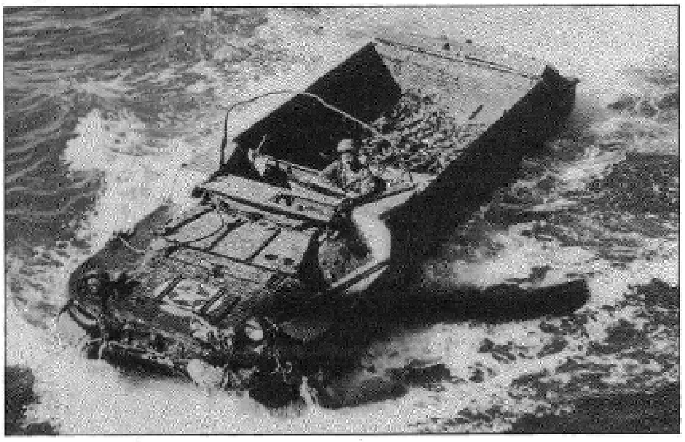
A close-up as one of the DUKWs comes ashore at Anzio on 2 November 1943. This vehicle has a .50 cal heavy machine gun mount fitted. (MHI)



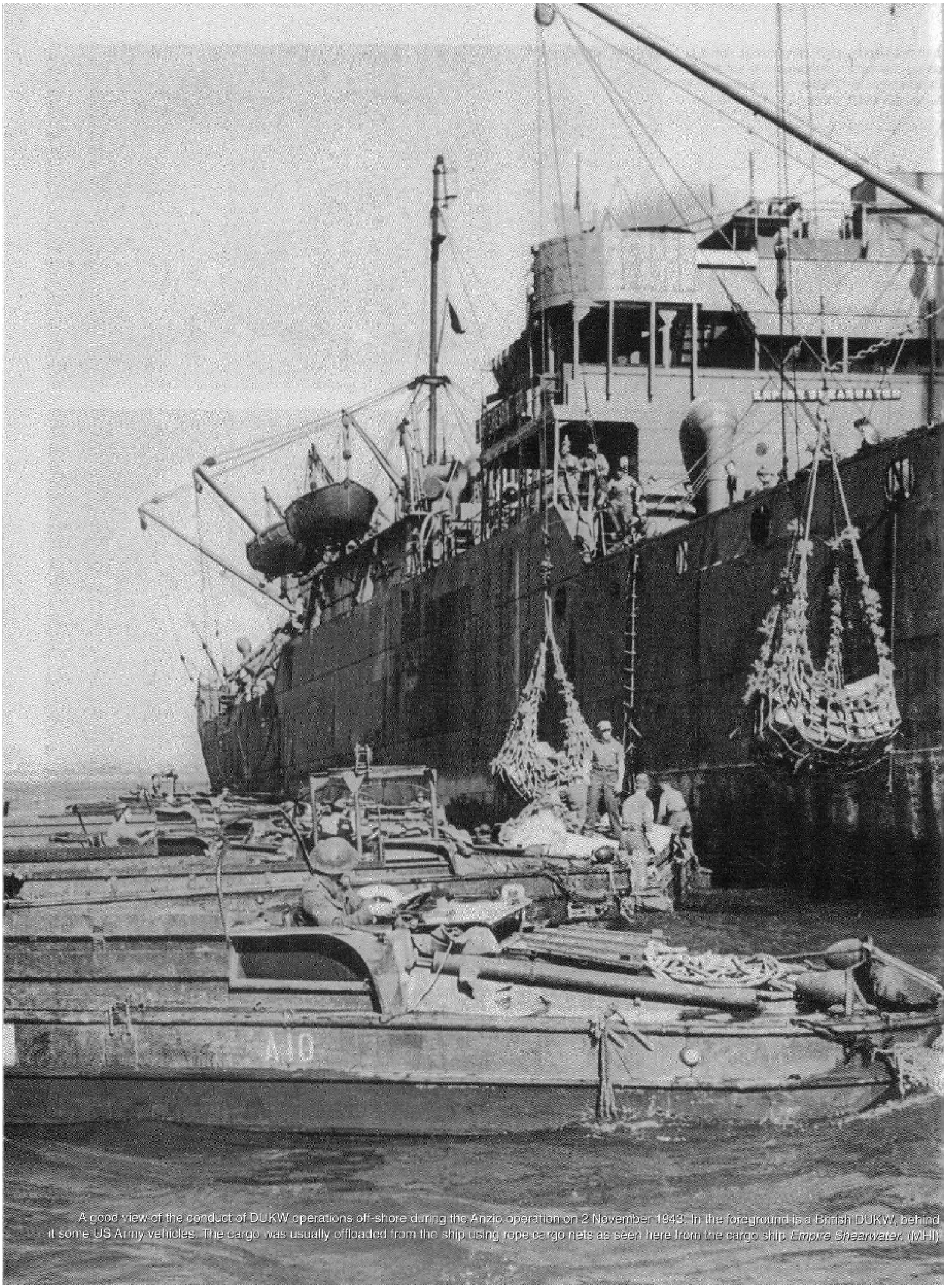




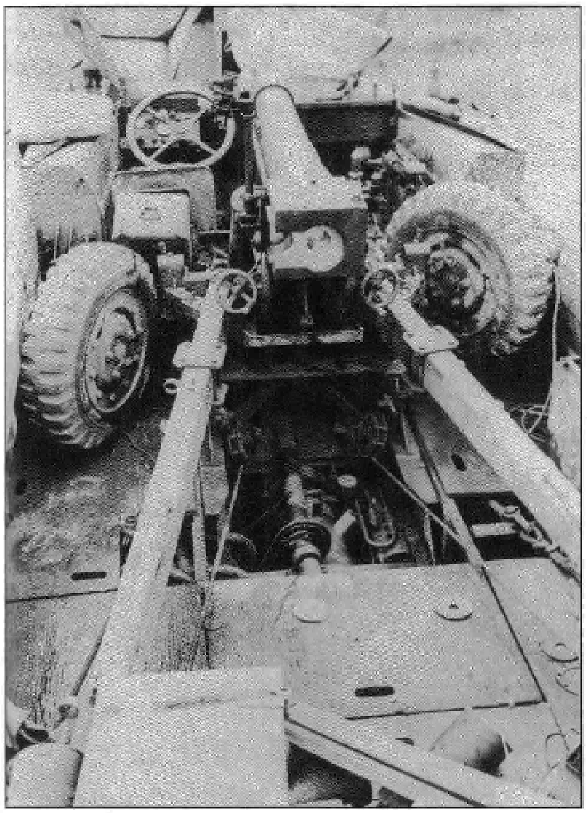
A good overview of the beach area at Anzio on 22 January 1944. with a number of LSTs unloading. The DUKW in the foreground has had a .50 cal machine gun ring mount added for self-defense. (MHI)



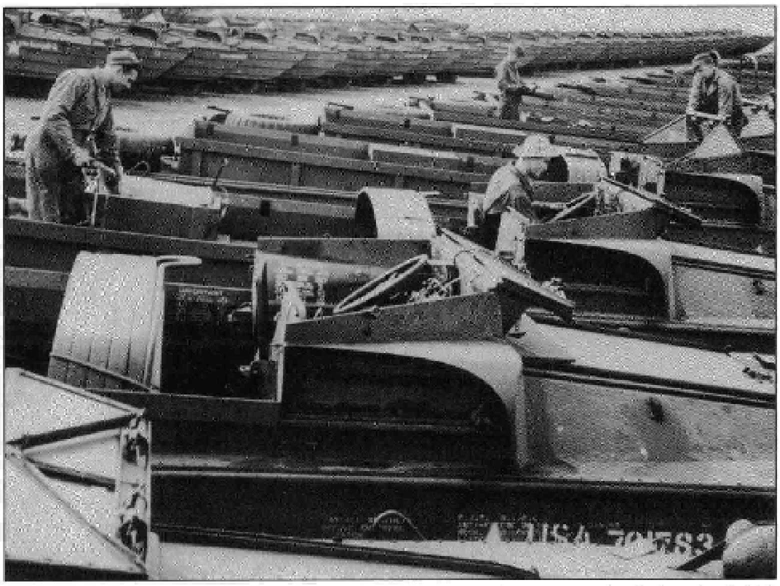
A DUKW heads back out to sea to gather another load during the Anzio operation. The rope net from its last cargo is in its hold. (MHI)



A good view of the conduct of DUKW operations off-shore during the Anzio operation on 2 November 1943. In the foreground is a British DUKW, behind it some US Army vehicles. The cargo was usually offloaded from the ship using rope cargo nets as seen here from the cargo ship *Empire Shearwater*. (MHI)

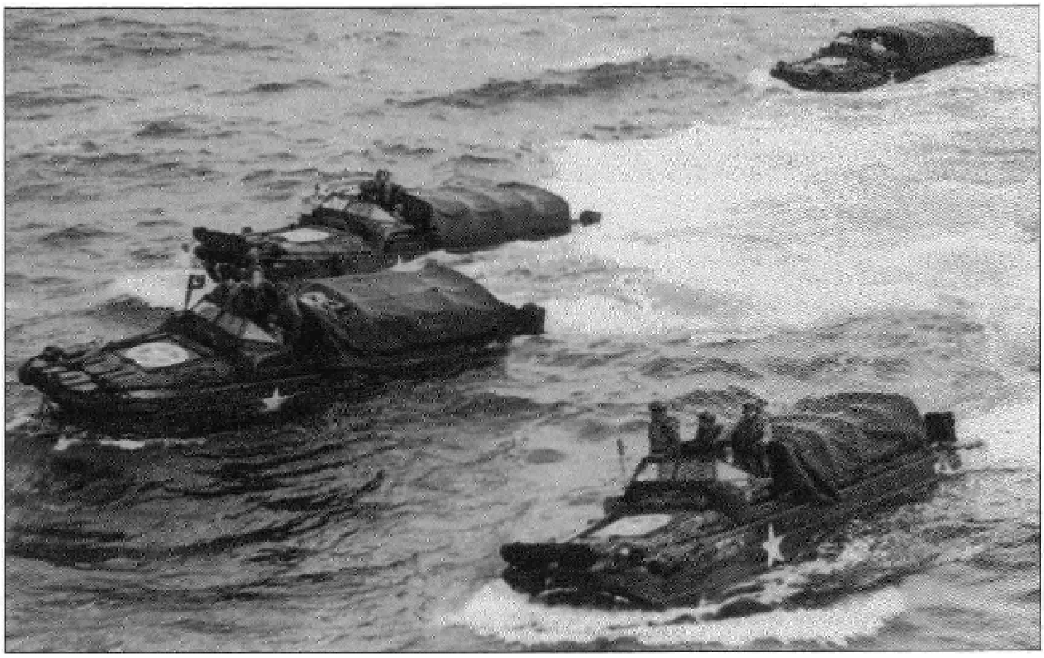


The smaller 105mm pack howitzer could bit fit inside the cargo area of a DUKW as seen here on a DUKW in Rome on 13 June 1944. (MHI)

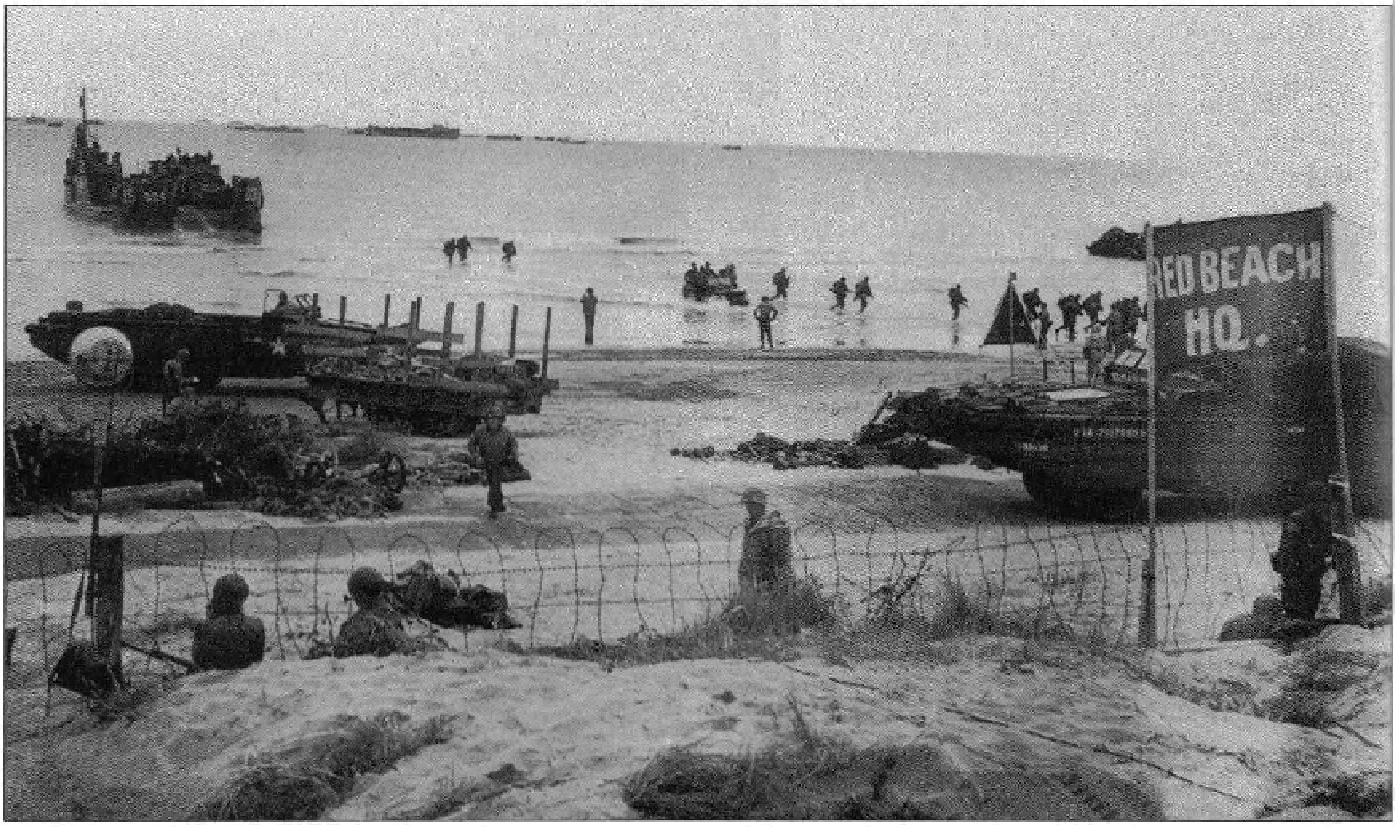


DUKWs played a vital role in the Normandy landings, not only during the initial landings, but in the subsequent supply operation. This is a group of DUKWs undergoing inspection in England on 20 May 1944 before the invasion. (MHI)

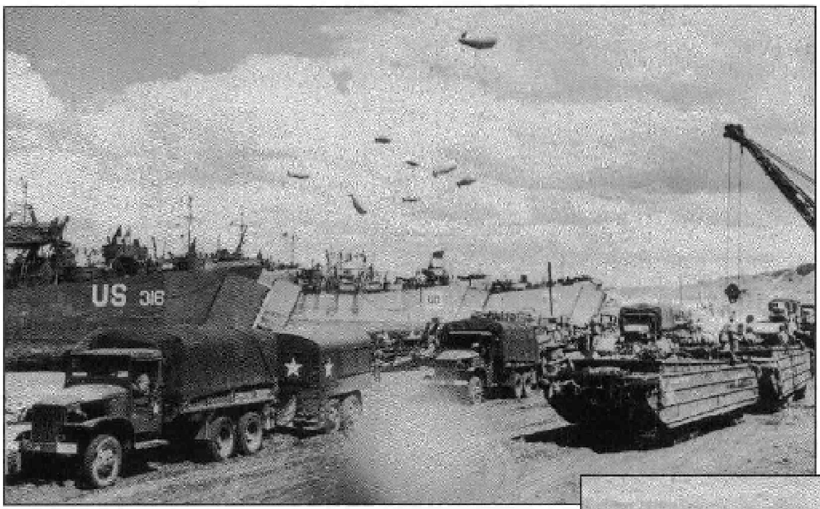
Amidst the jumble of equipment at Normandy on D-Day are a pair of M3 half-tracks and a DUKW in the center. The DUKWs were not used in the initial attack waves, but were used extensively in follow on waves to bring in much needed supplies. (MHI)



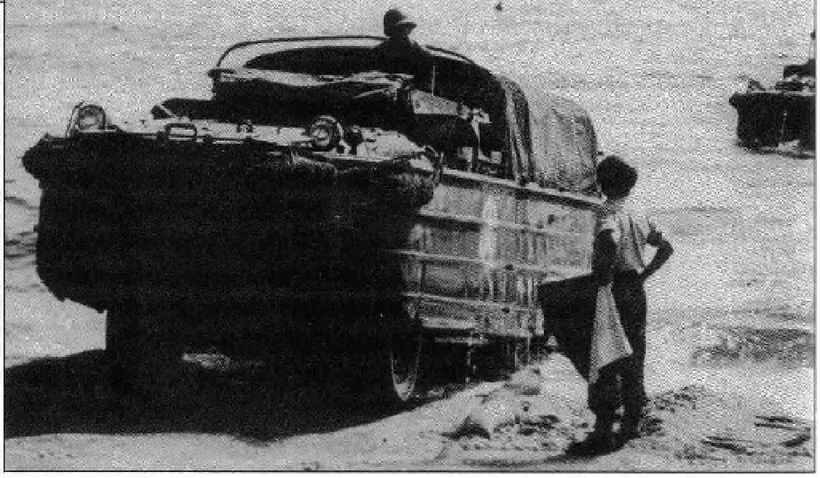
DUKWs move ashore during the amphibious landings at Normandy on D-Day, 6 June 1944. (MHI)



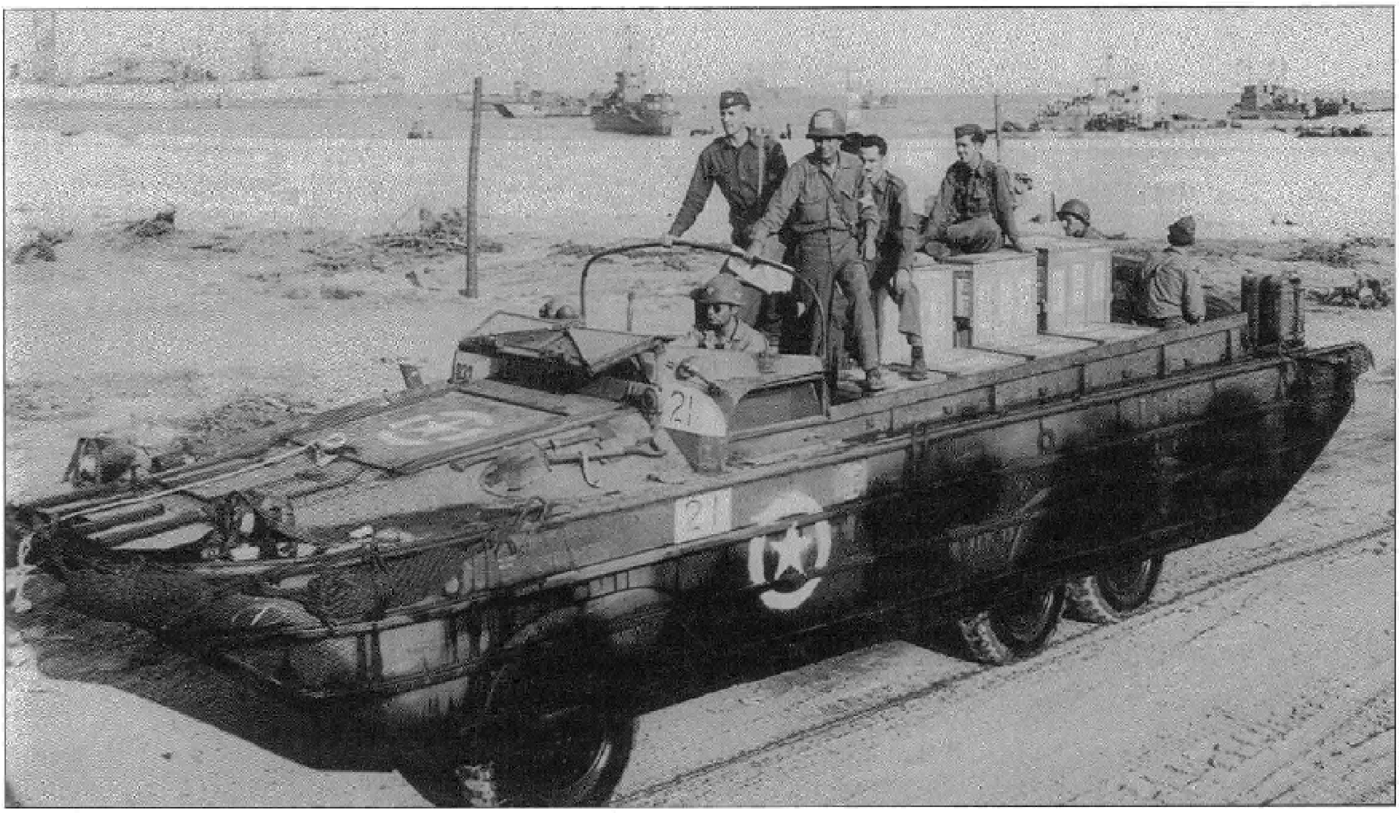
A pair of DUKWs moves supplies inland from Red Beach, near Les Dunes de Madeleine on the Normandy beaches on 12 June 1944. In the background is a LCM landing a half-track as a jeep wades ashore. (MHI)



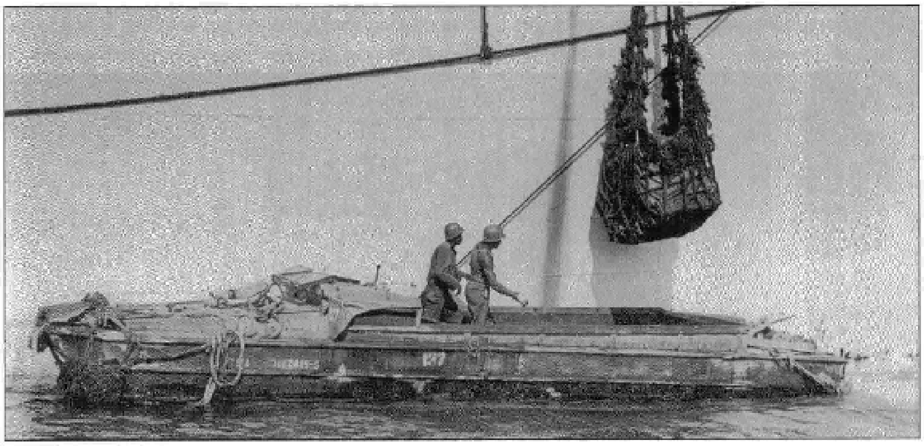
By the middle of July, the Normandy beaches were teaming with equipment, including the two DUKWs evident to the right. For four months, DUKWs were responsible for handling 40% of all over-the-beach cargo that came ashore at Normandy. (MHI)



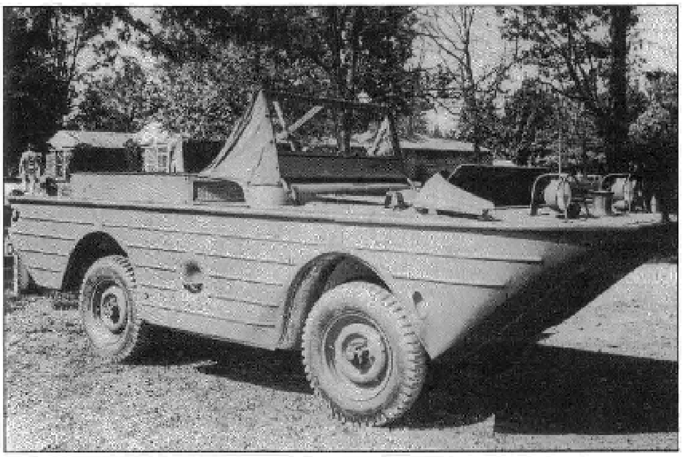
In August, the US Army landed at beaches along the southern French coast during Operation Anvil. These DUKWs are coming shore in support of the 45th Infantry Division near St. Maxime on 15 August 1944. (MHI)



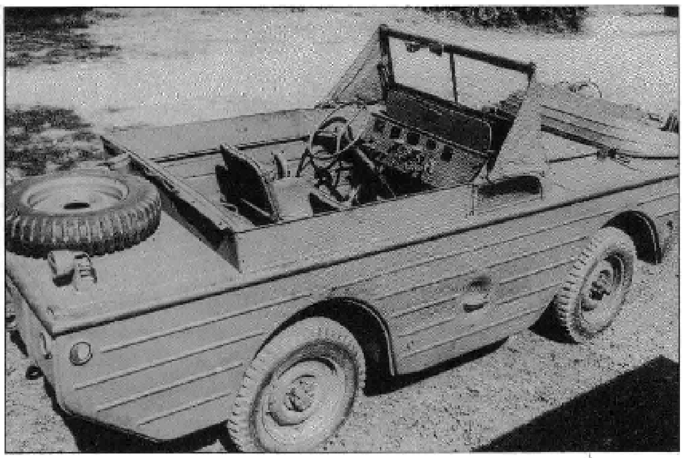
A DUKW carries supplies and personnel for the 7th Army Field Hospital during landings at St. Maxime on France's Mediterranean coast on 26 August 1944. This vehicle is finished in a camouflage pattern of black along the lower sides on top of the usual olive drab. (MHI)



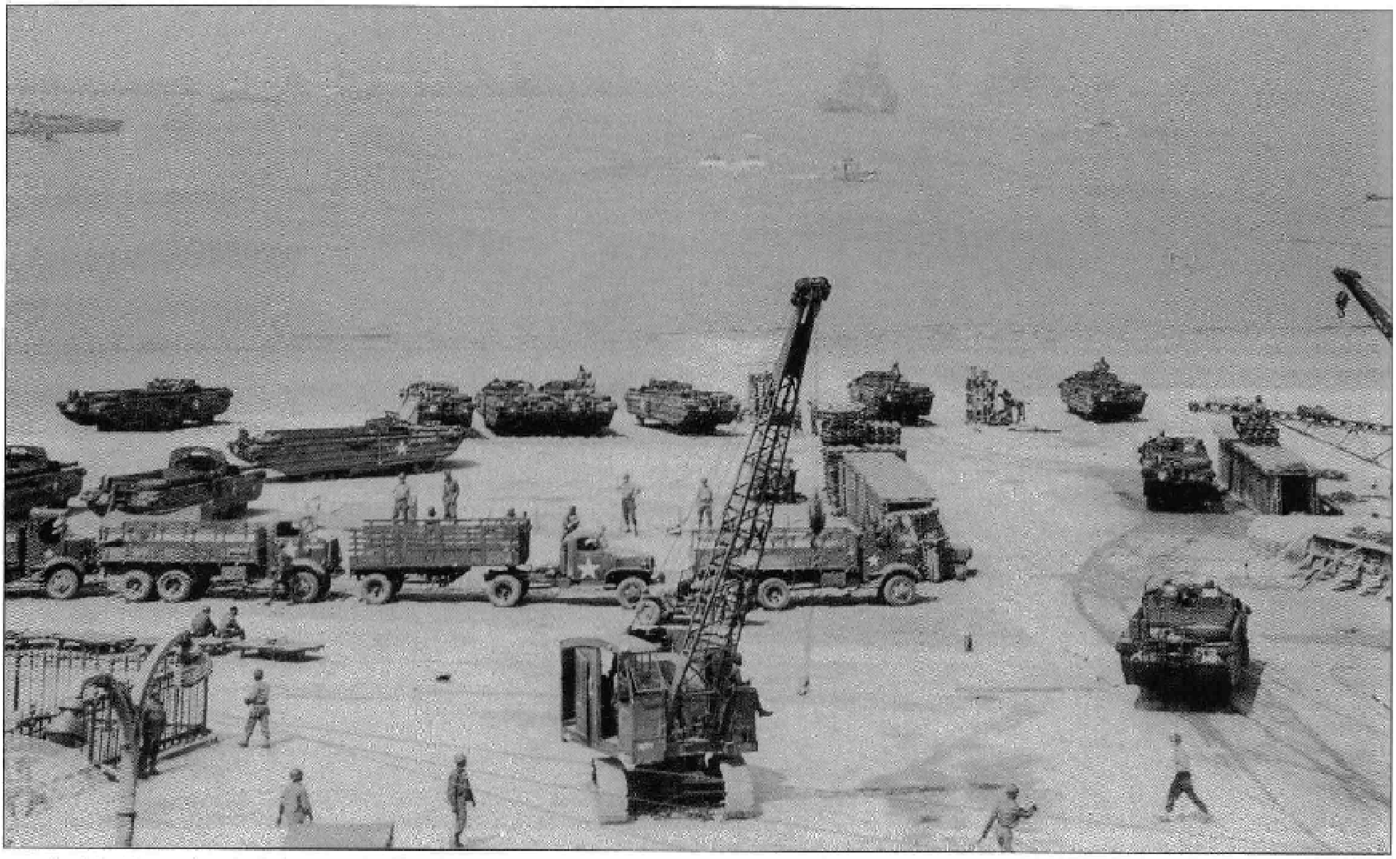
A DUKW is loaded from a transport ship during Operation Anvil in southern France on 18 August 1944. (MHI)



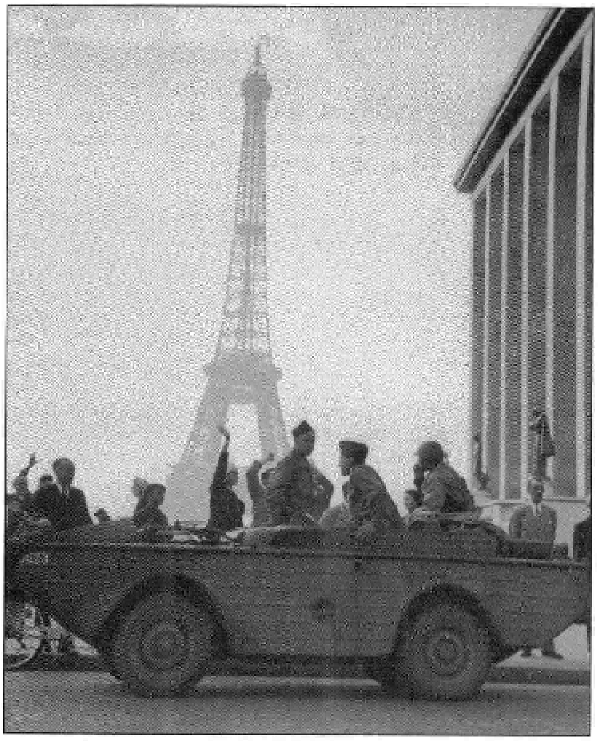
The Ford GPA was an amphibious version of the jeep, and sometimes nicknamed the "seep" due to the family tie. It was intended as a utility vehicle, and actually preceded the DUKW. (MHI)



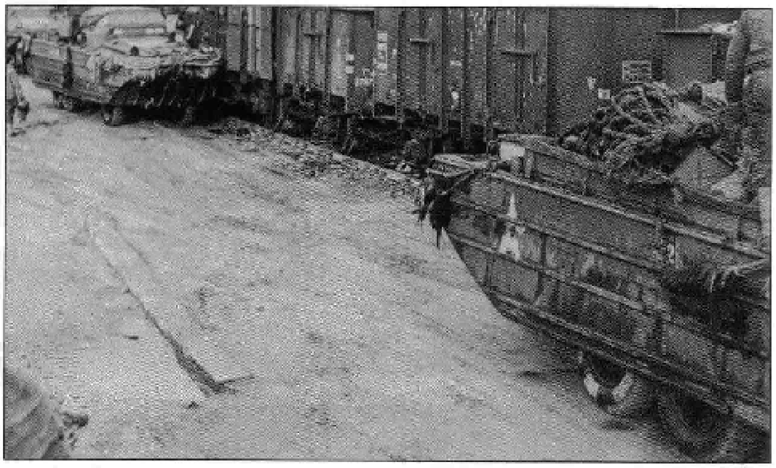
This rearview of the GPA shows its relatively small interior space. The canvas curtains on the side of the windshield were intended to keep water from splashing inside when traveling in water. (MHI)



As Allied forces fought their way out of the Normandy beach-head, more ports gradually became available. This is the scene near Cherbourg where a large number of DUKWs are being used to move supplies ashore to waiting trucks. The crane was used to off-load the DUKW cargo, and then shift it to the trucks for passage inland. (MHI)

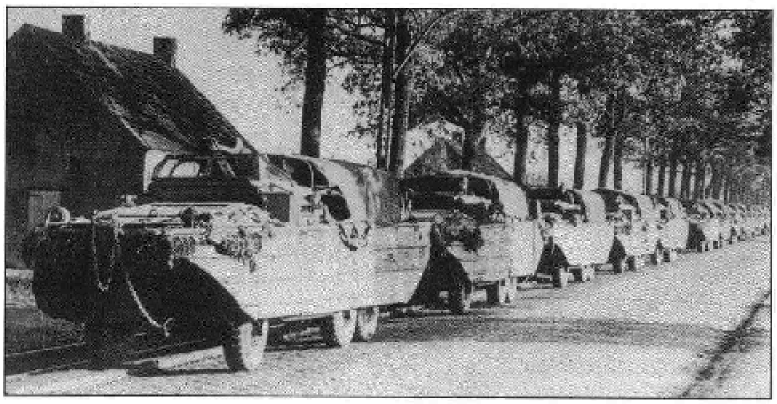


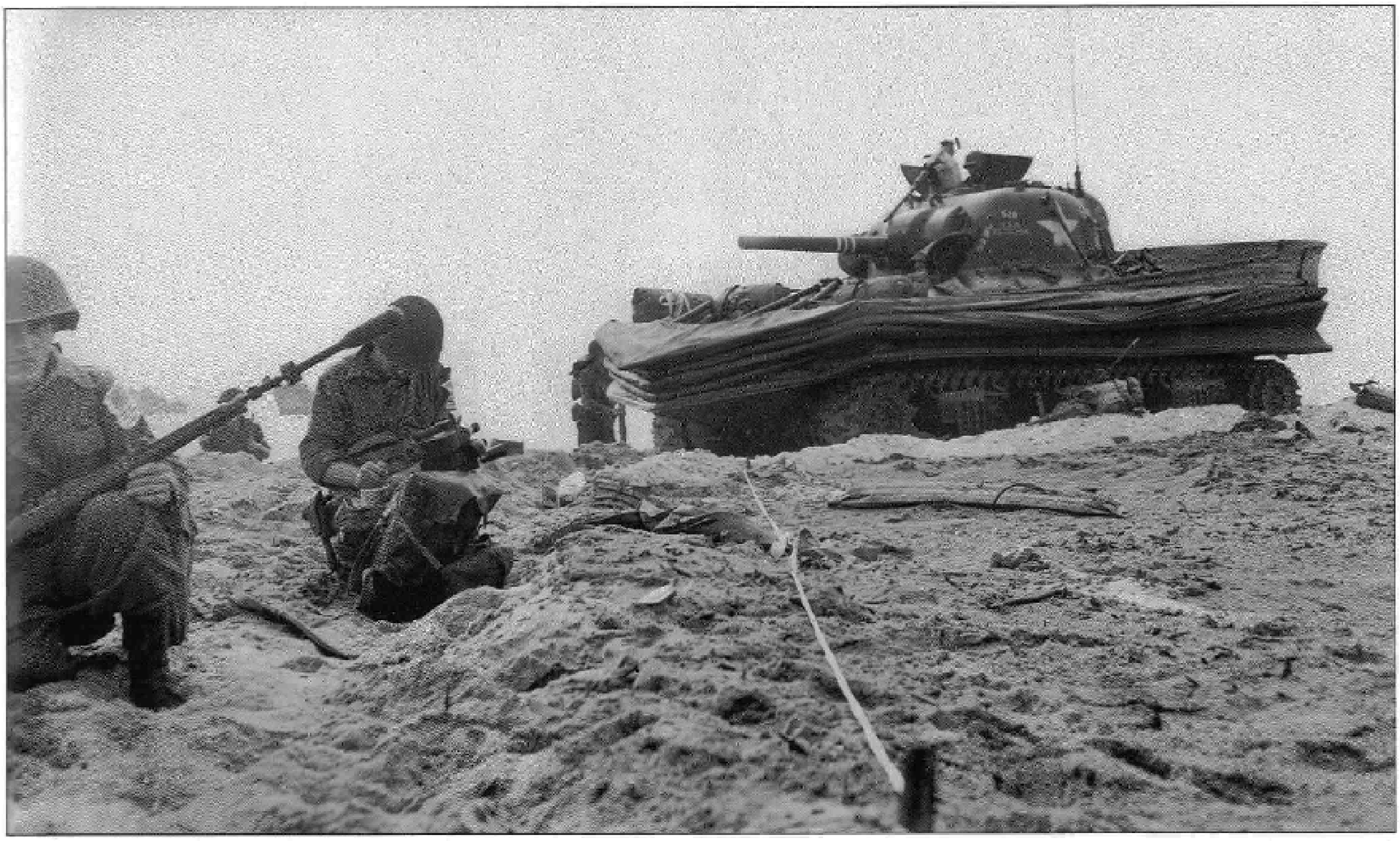
A US Army Ford GPA on the Trocadero in Paris, overlooking the Eifel Tower in August, 1944. (MHI)



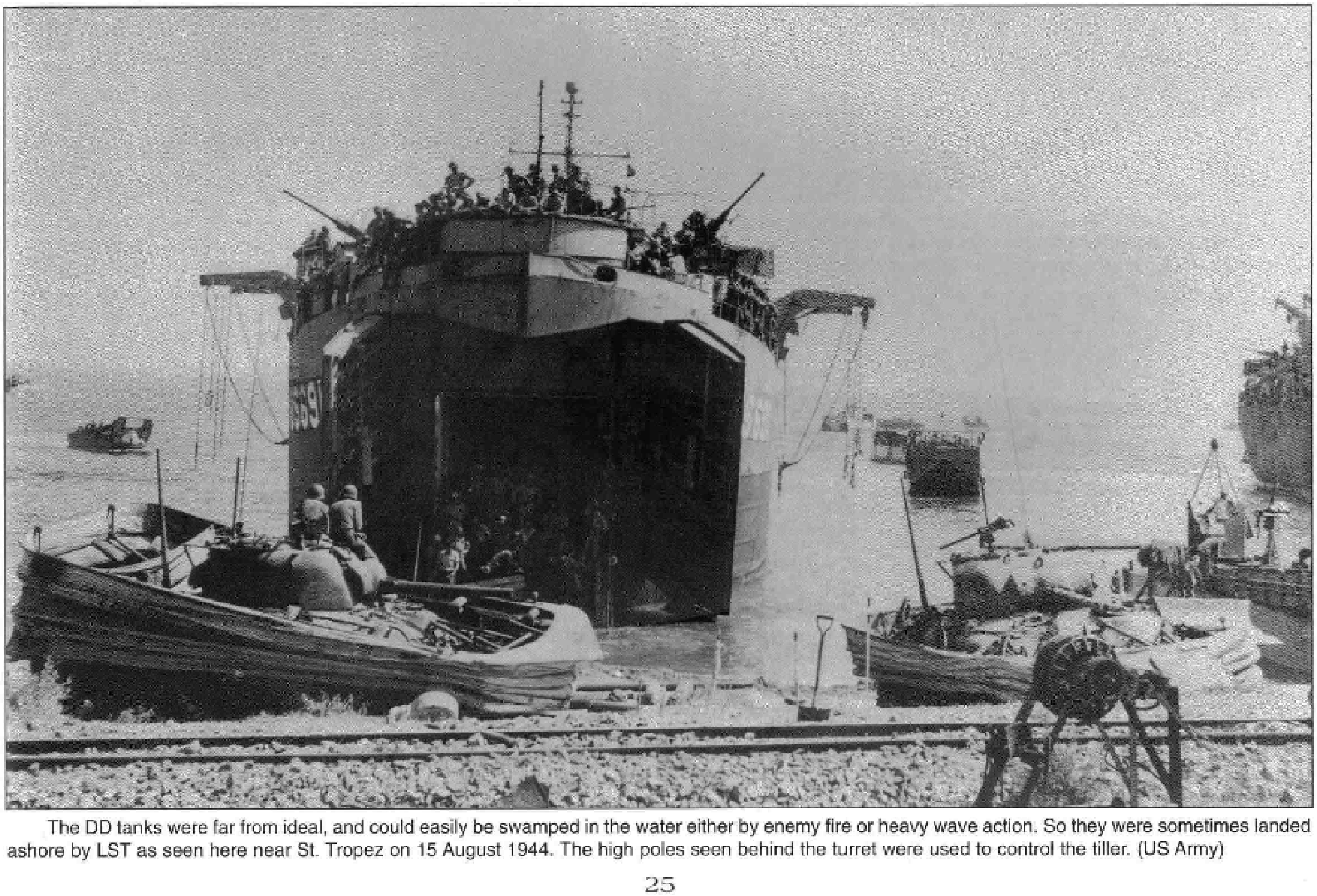
DUKWs are used to move cargo up to the rail-head in the port of Le Havre in Normandy on 15 November 1944. (MHI)

DUKWs were used by many other Allied forces in the northwest Europe campaign. This is a column of British DUKWs being used to support the 1st Polish Armored Division in 1944. (Sikorski Institute)

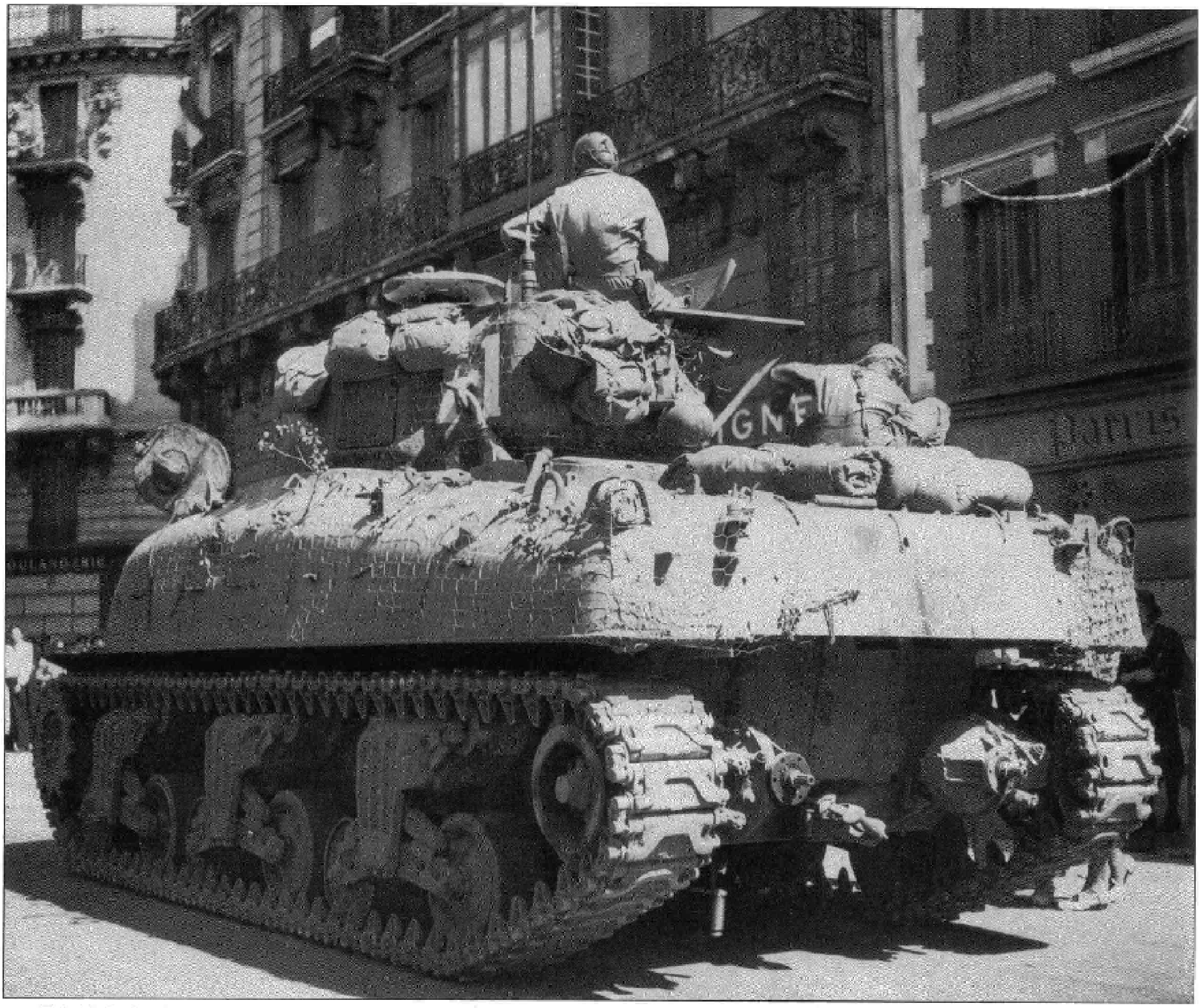




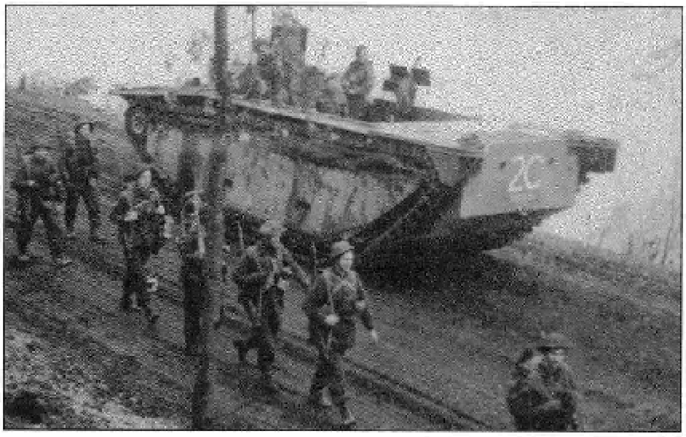
No amtanks were used in the European Theater of Operations. However, there was one type of amphibious tank used in Europe, the DD (Duplex Drive) Sherman. This was a British development and consisted of a canvas skirt around the tank to provide buoyancy and a propeller system to power the tank in the water. The DD tanks were used during the Normandy landings, and also during the landings in southern France during Operation Anvil. This DD tank has come ashore to support the 15th Infantry Regiment, 3rd Division near St. Tropez on 15 August 1944. (US Army)



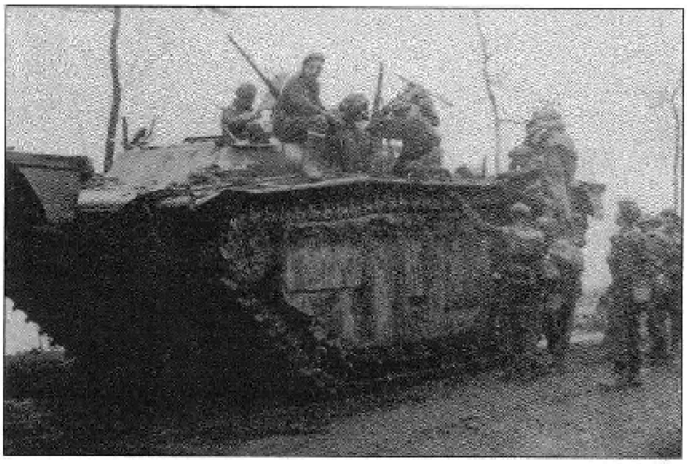
The DD tanks were far from ideal, and could easily be swamped in the water either by enemy fire or heavy wave action. So they were sometimes landed ashore by LST as seen here near St. Tropez on 15 August 1944. The high poles seen behind the turret were used to control the tiller. (US Army)



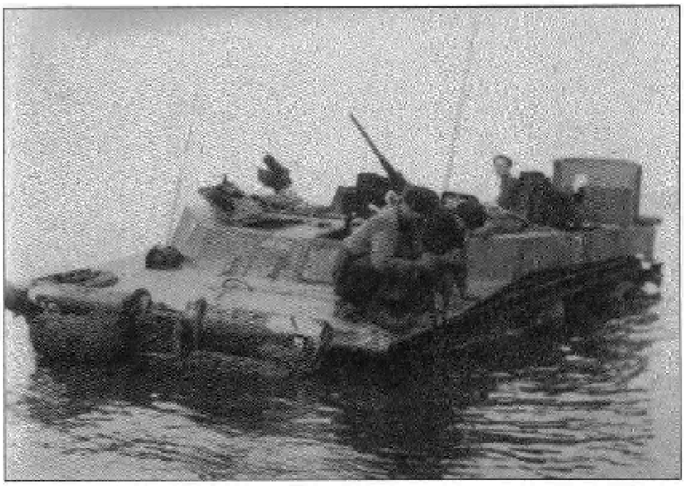
This M4A1 Duplex Drive has had most of its specialized equipment removed by the time it reached Paris in August 1944. The screen has long since disappeared, but other tell-tale signs of its DD origins are evident such as the remnants of the DD propulsion system on the rear, and the special idler wheel used on the DD tanks. This is a very late production M4A1 with the 75mm gun, but featuring the revised hull. (USS Intrepid Museum via Frank DeSisto)



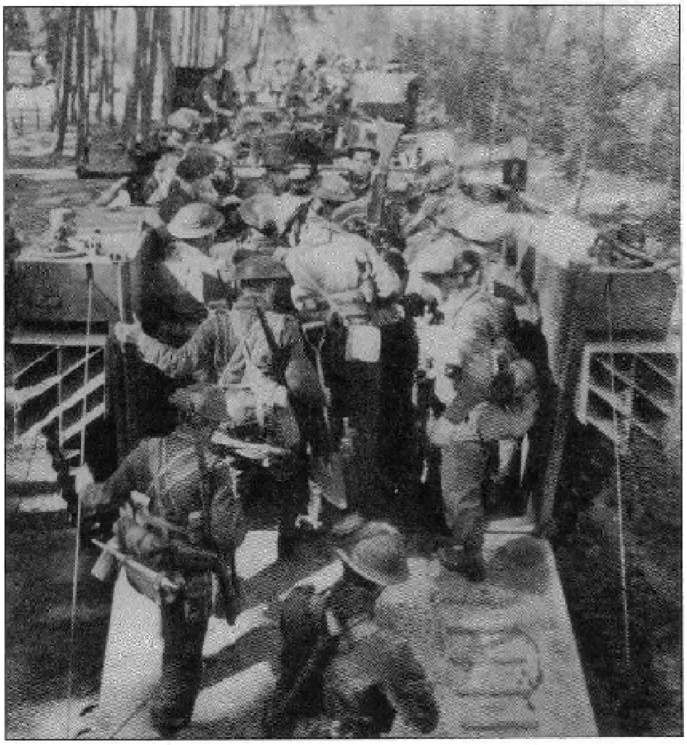
The first large scale use of the amtracs in northern Europe took place in October 1944 when the British 21st Army Group began attempts to clear the Scheldt estuary to free up the port of Antwerp. The many flooded regions, dikes, and other water obstructions made the amtrac a useful means of transport. The Buffaloes were operated mainly by the 5th Assault Regiment Royal Engineers of the 79th Armoured Division, seen here with Canadian troops. (USNA)



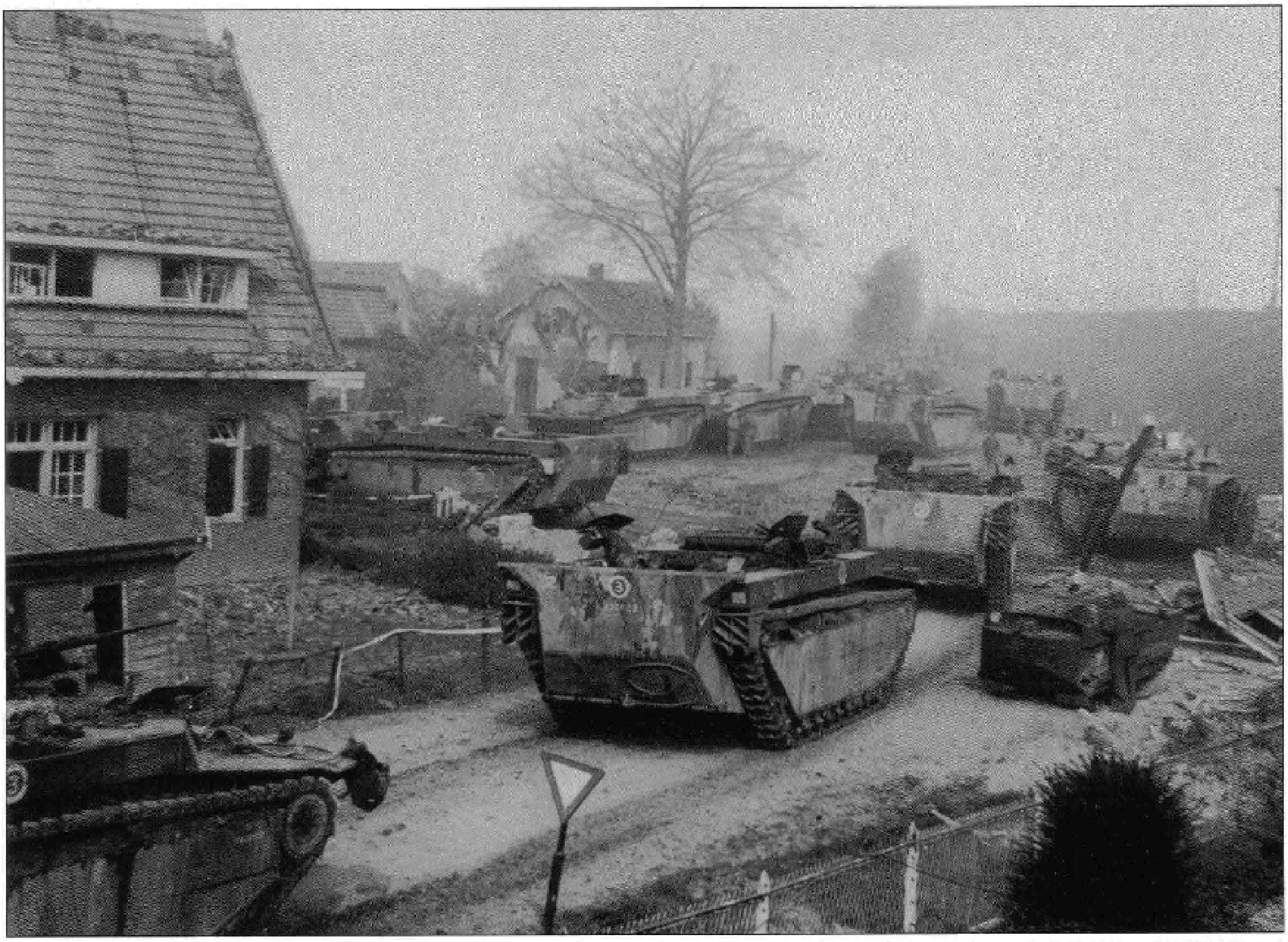
As with the US forces in the Pacific, the British soon learned to add armor shields around the amtrac machine guns. Here, a Canadian infantry unit loads aboard a Buffalo II (LVT(A)-2) during the operations in the Scheldt estuary. The first Buffalo operations against Terneuzen were conducted by the Highland Light Infantry of Canada and the North Nova Scotia Highlanders. (USNA)



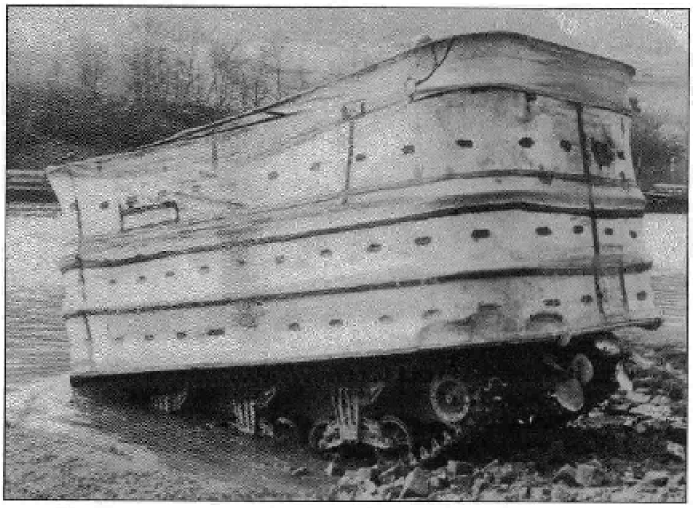
A Buffalo IV (LVT-4) of the 5th Assault Regiment RE in the waters along the Dutch coast during the autumn 1944 operations. The armored cover over the side machine gun station is evident in this view. (USNA)



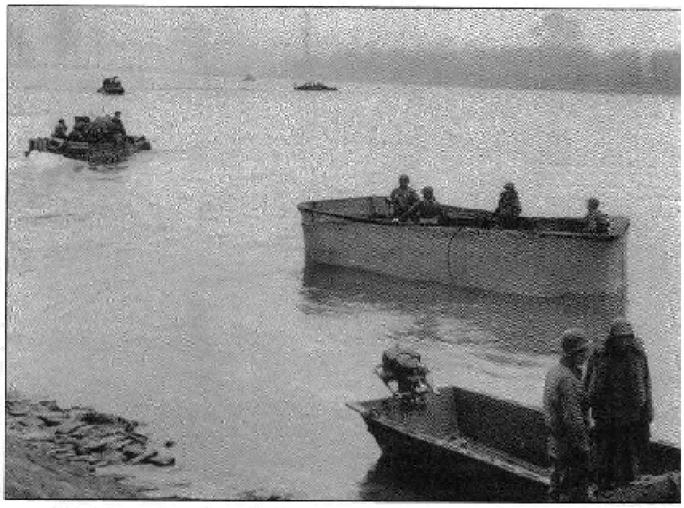
Canadian infantry load aboard a Buffalo IV (LVT-4) of the 5th Assault Regiment RE during operations in Holland. The LVT-4 was generally preferred to the older LVT-2, as access in and out of the troop compartment was much easier. (USNA)



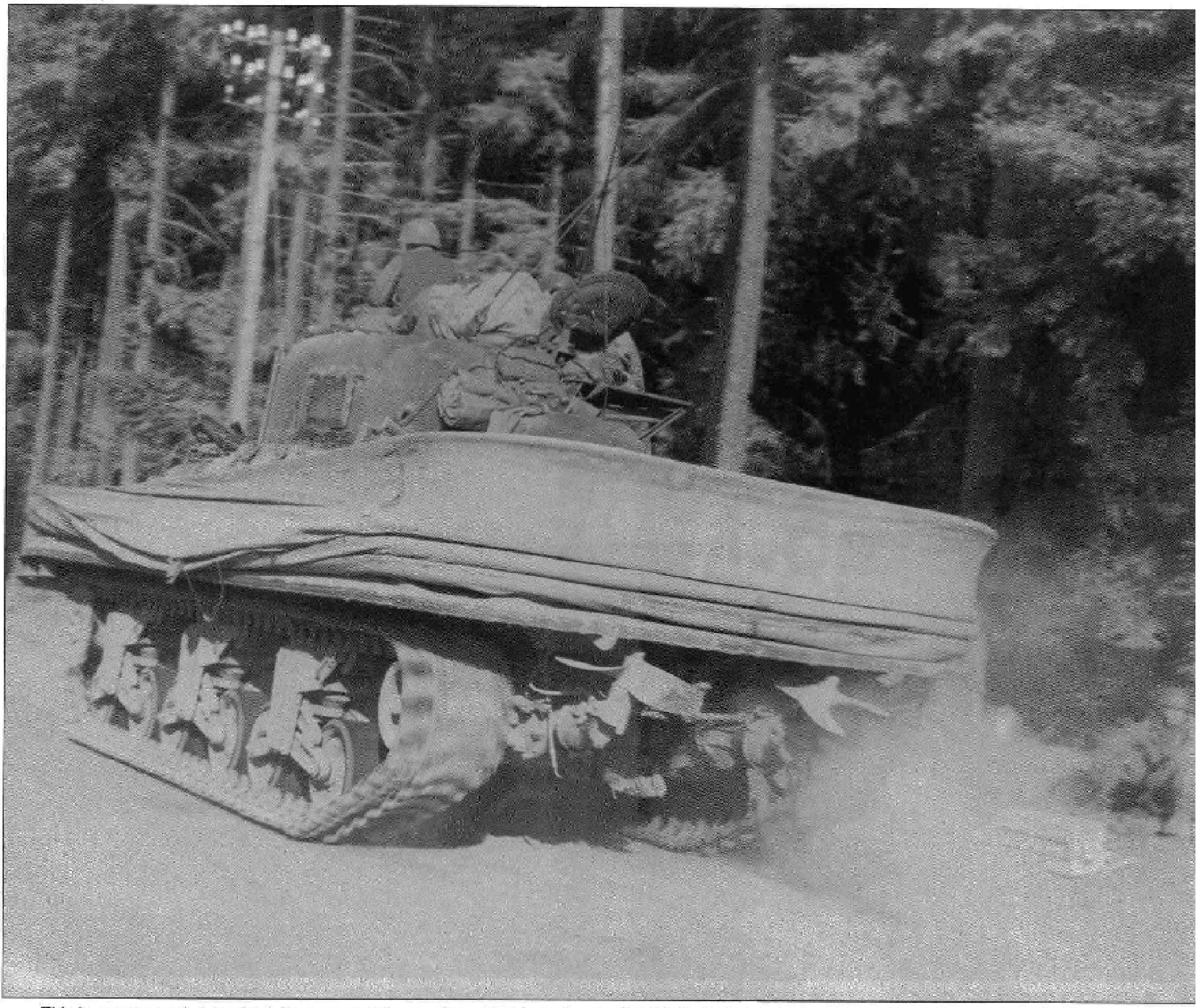
Buffalo IVs of the 1st Lothians, 79th Armoured Division, prepare for operations in a small Dutch town. This unit also made limited use of M29C Weasel amphibious utility vehicles, one of which can be seen to the right. There is considerable variation in the machine gun mountings on the vehicles, some using simple shields, other using enclosed shields. (USNA)



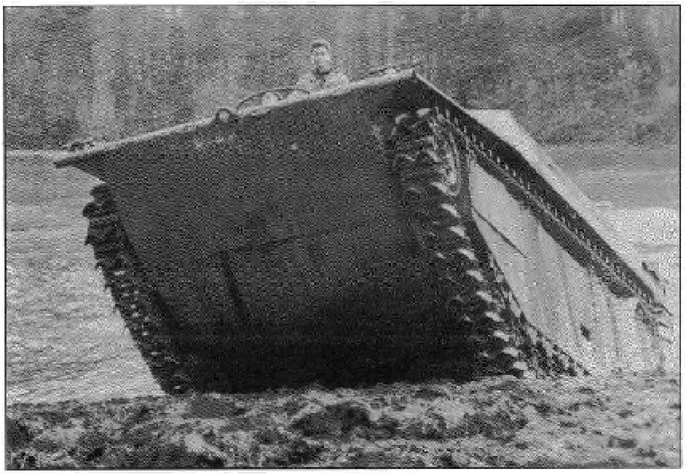
The DD tanks were used once again in the later phases of the war as Allied forces began approaching the major German river networks, including the Rhine. This is a good view of the appearance of a DD Sherman with the screen fully erected, entering a river for training before the Rhine crossings in 1945. (US Army)



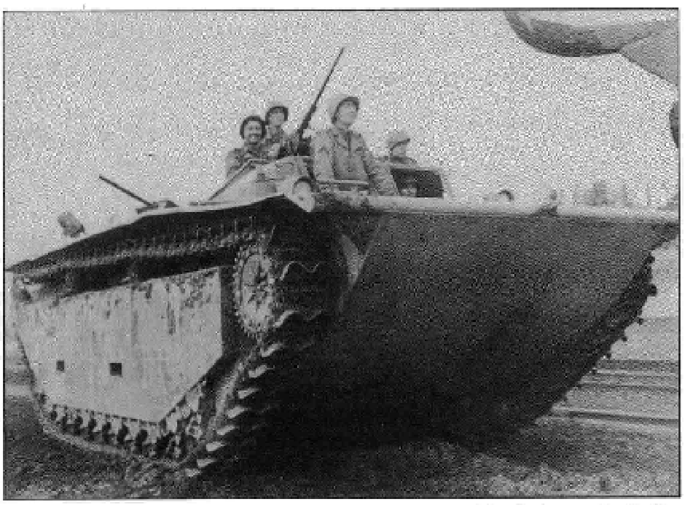
This interesting view of US Army river operations in the spring of 1945 shows a DD Sherman in the foreground, and a trio of DUKWs behind it. (MHI)



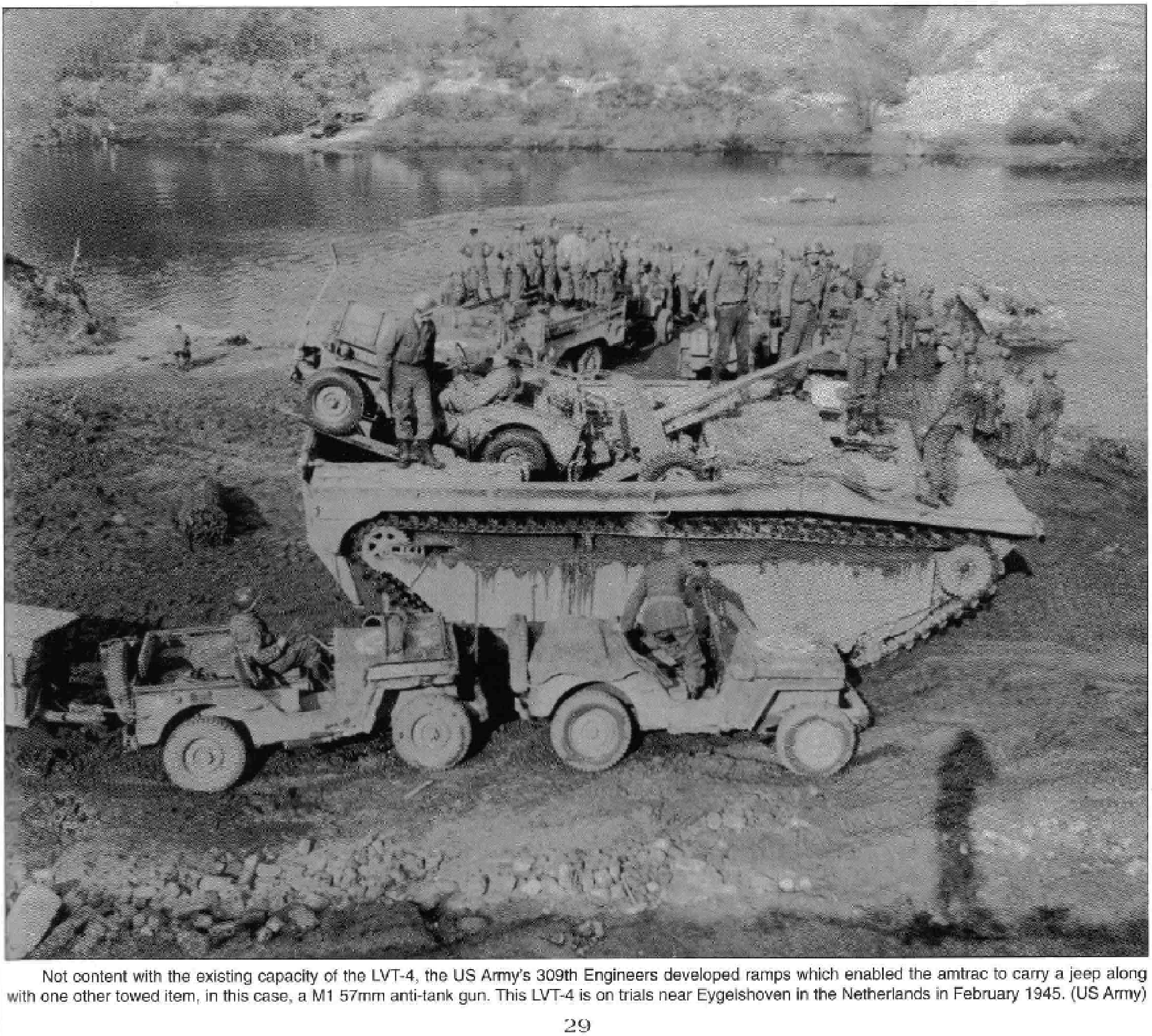
This is a very good view of a fully equipped Duplex Drive M4A1 medium tank of Patton's 3rd Army near Braunshorn, Germany on 24 March 1945 after the Rhine crossings. This shows the screen folded down, and the propellers in the retracted position. (US Army)



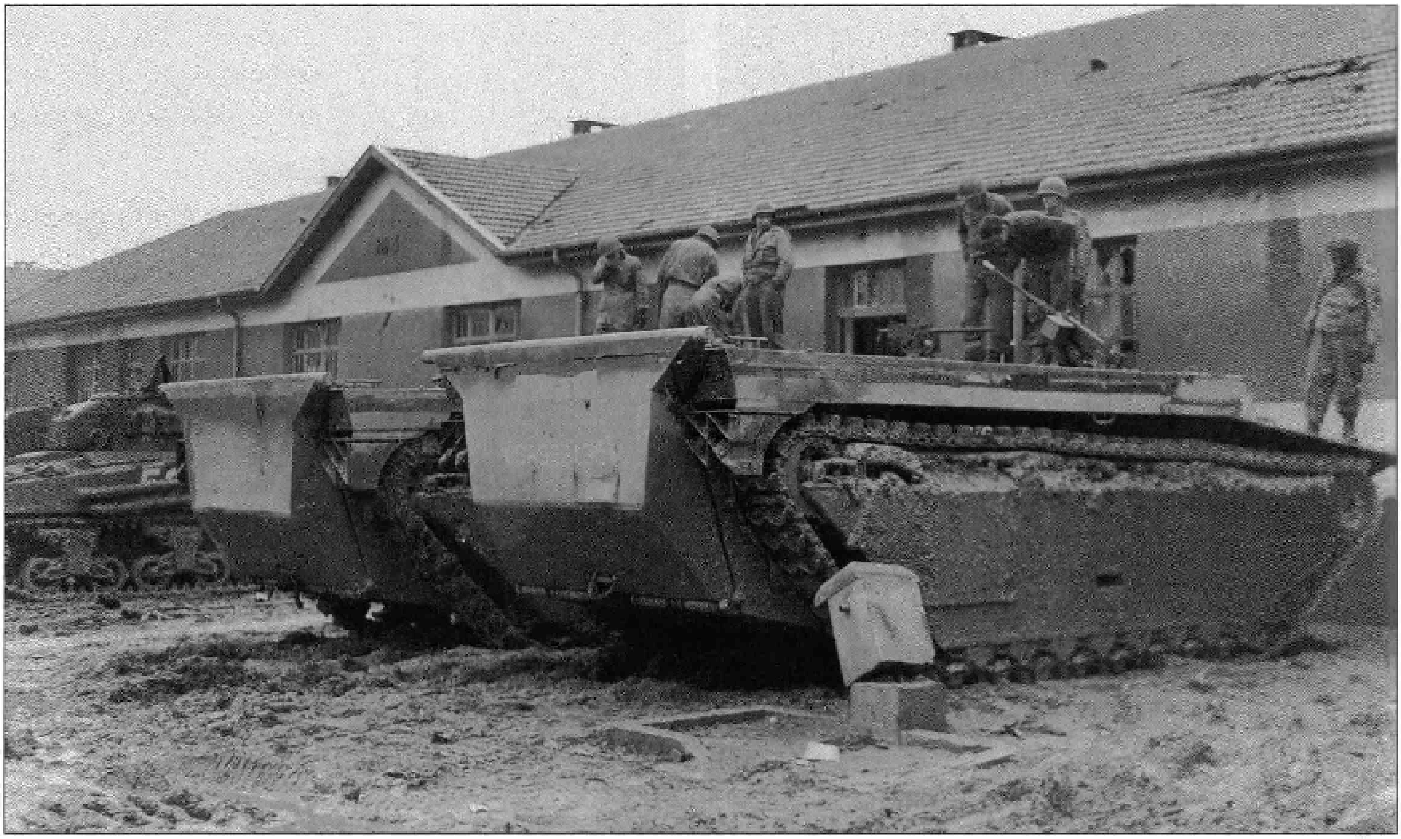
Amtracs were not widely used in the European Theater of Operations until 1945. After ignoring their potential during the Normandy operation, the US Army reconsidered their use for the crossing of the Rhine in the spring of 1944. Amtrac units began to be moved into Europe in November 1944 for the expected spring operations. This is a LVT-4 during river training operations near Herzoganrath, Germany on 28 November 1944. (MHI)



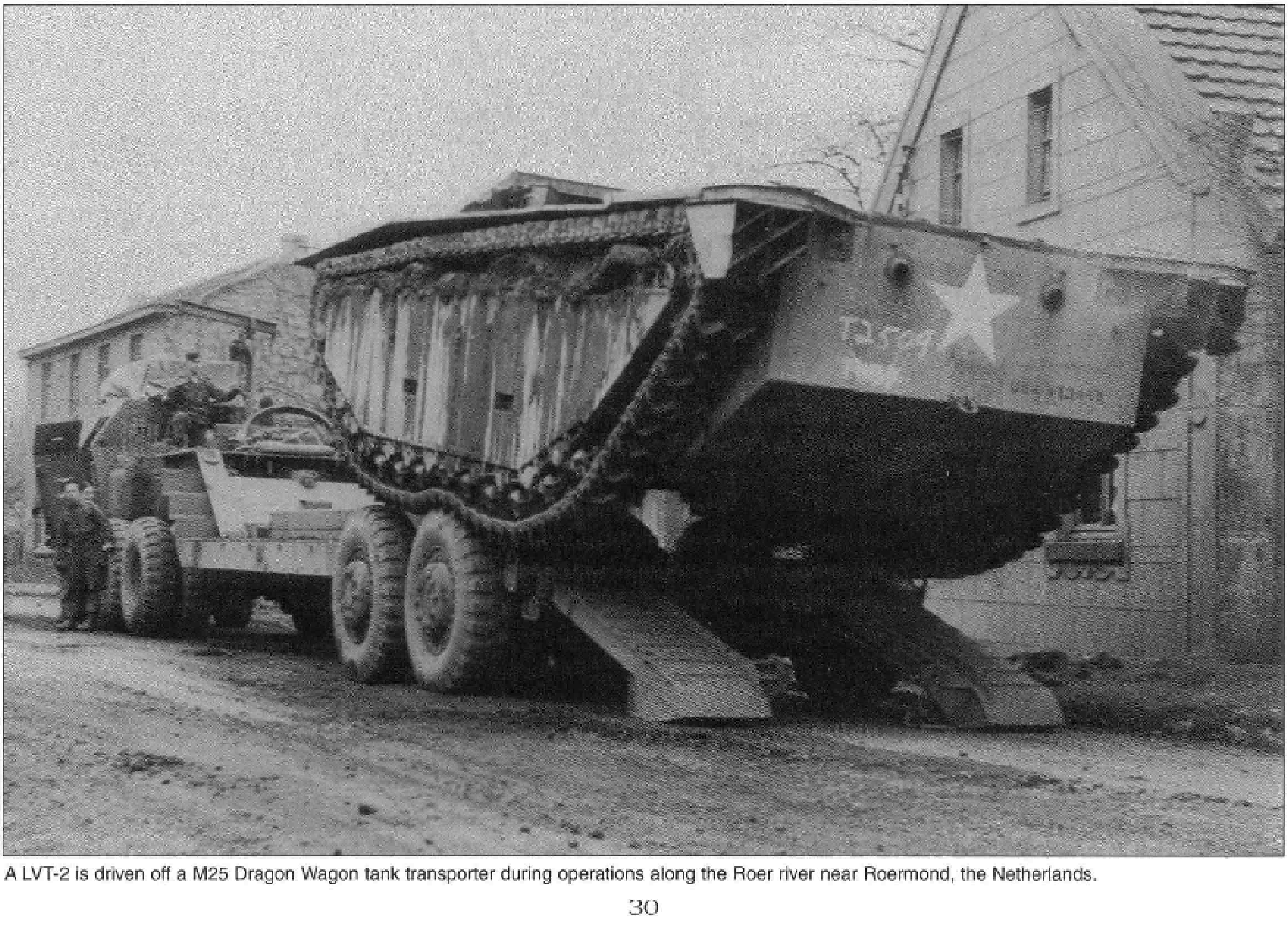
The LVT-4 was the most common amtrac used in Germany in 1945. But the LVT-2, and even some old LVT-1 were also used. This is a LVT-2 in use in Germany in 1945 by Army troops. (Patton Museum)



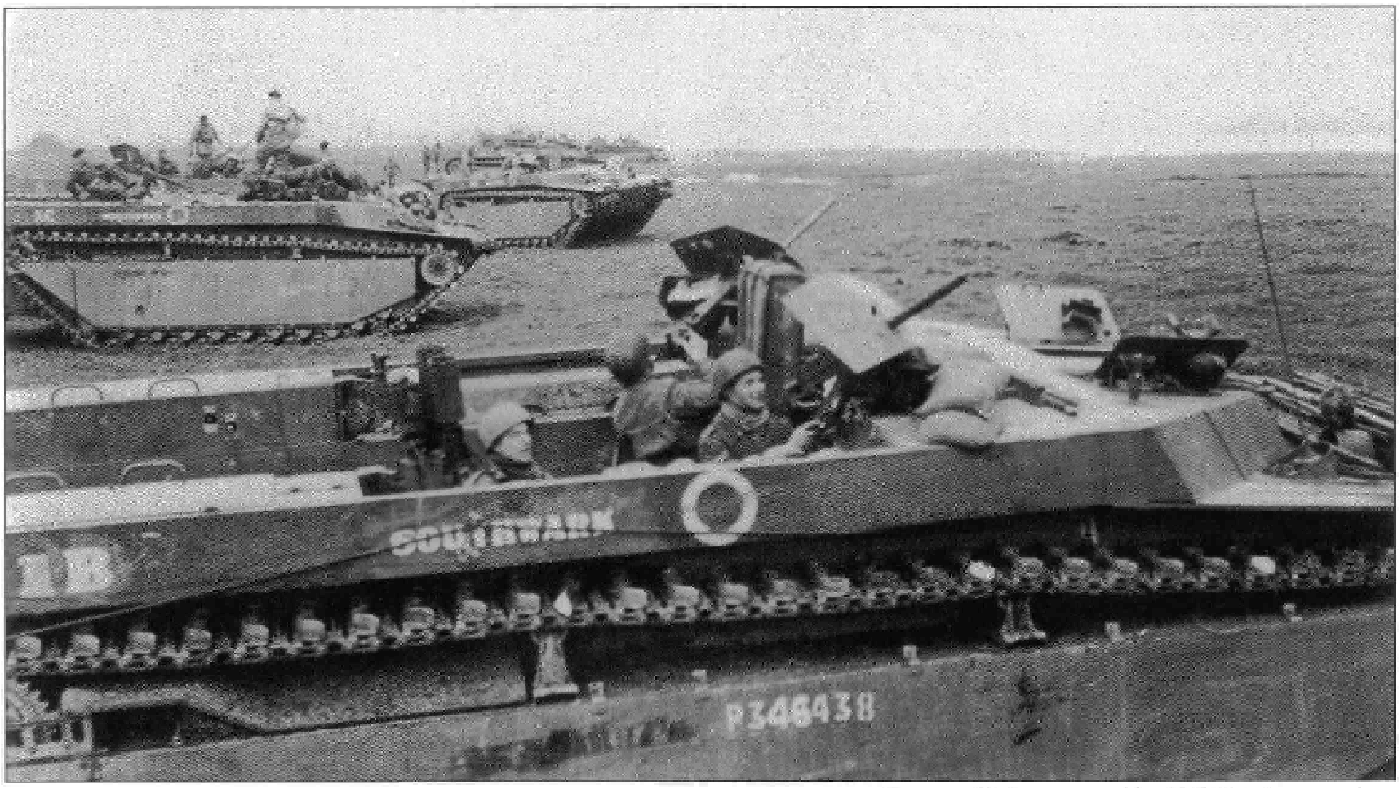
Not content with the existing capacity of the LVT-4, the US Army's 309th Engineers developed ramps which enabled the amtrac to carry a jeep along with one other towed item, in this case, a M1 57mm anti-tank gun. This LVT-4 is on trials near Eygelshoven in the Netherlands in February 1945. (US Army)



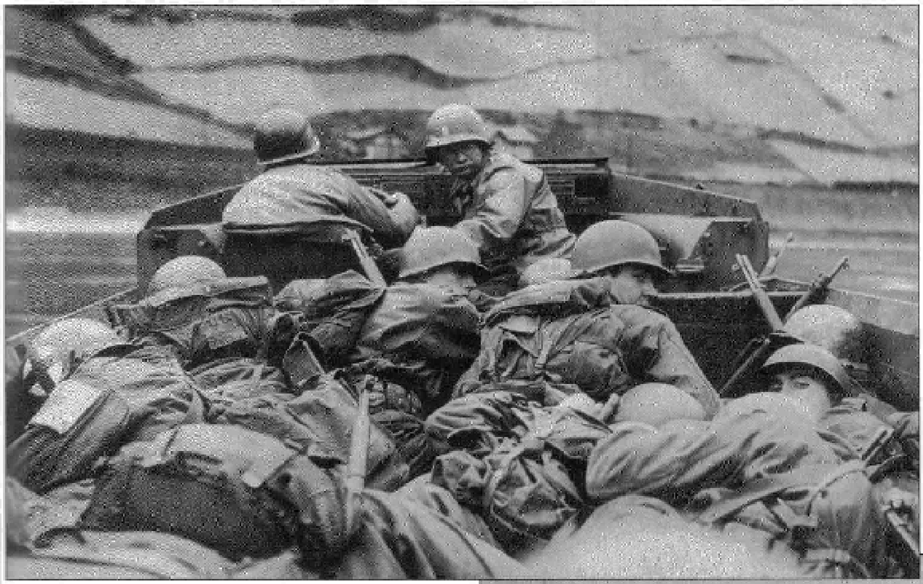
These LVT-4 amtracs have just been delivered to the 6th Armored Division for planned river crossing operations. These arrived while part of the division was near Valette, France on 7 December 1944. (US Army)



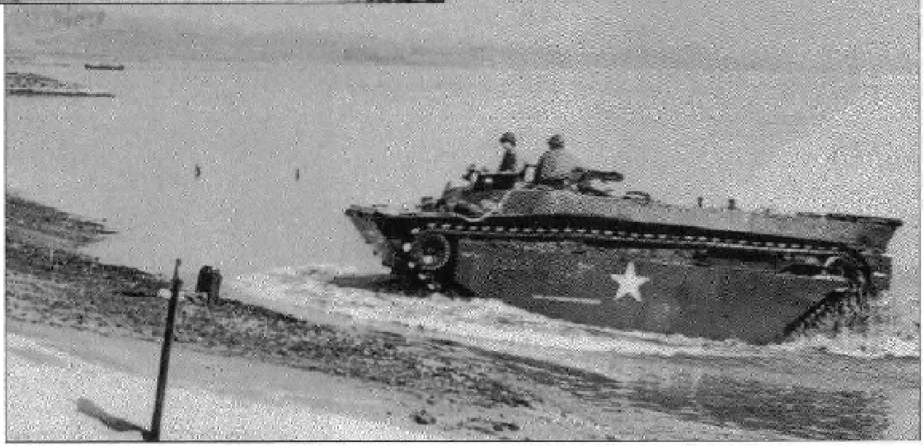
A LVT-2 is driven off a M25 Dragon Wagon tank transporter during operations along the Roer river near Roermond, the Netherlands.



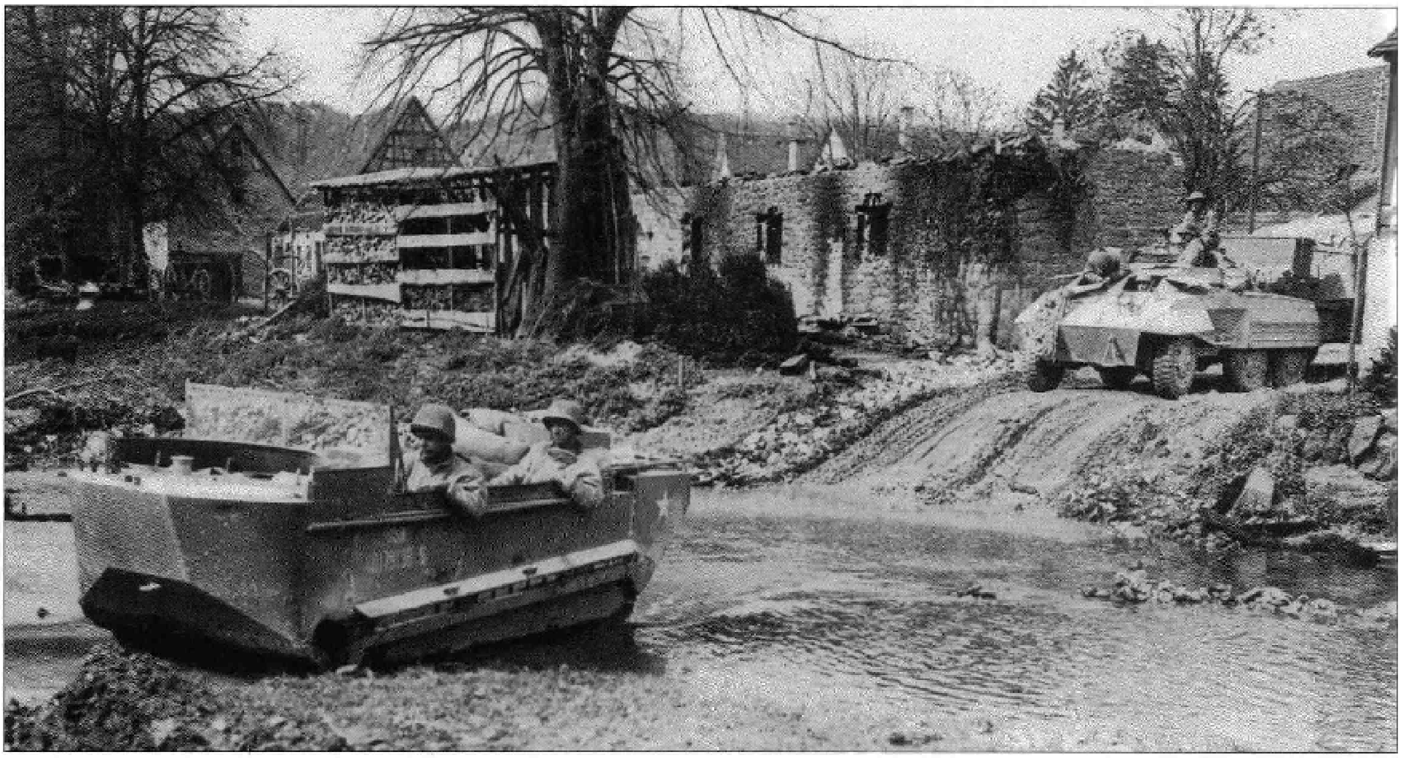
The British Army made extensive use of amtracs during river crossing operations in Germany. These are LVT-4 amtracs of the 11 RTR during operations along the Elbe river on 29 August 1945. (USNA)



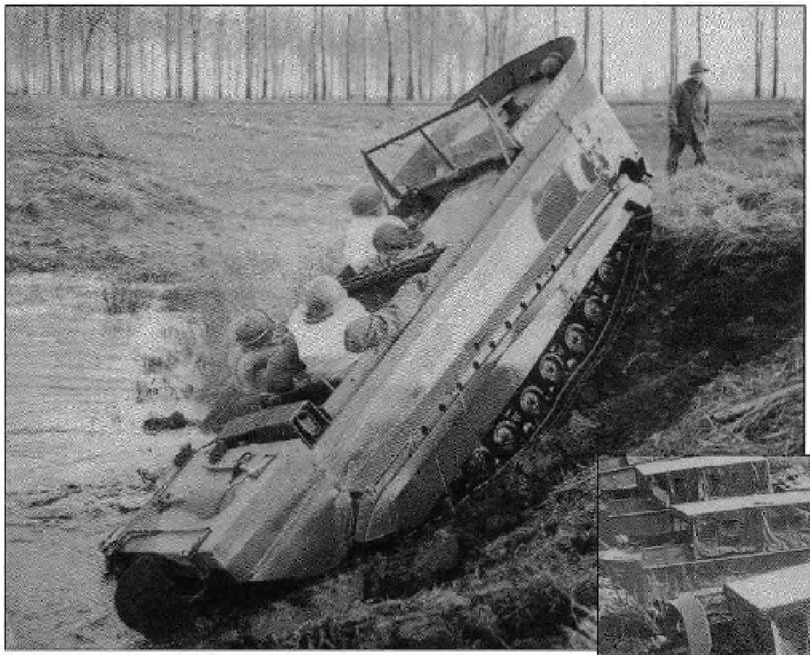
Although DUKWs were not intended for assault landings, they were sometimes used in this role. Here, an infantry squad ducks for cover as their DUKW approaches the eastern bank of the Rhine river. (MHI)



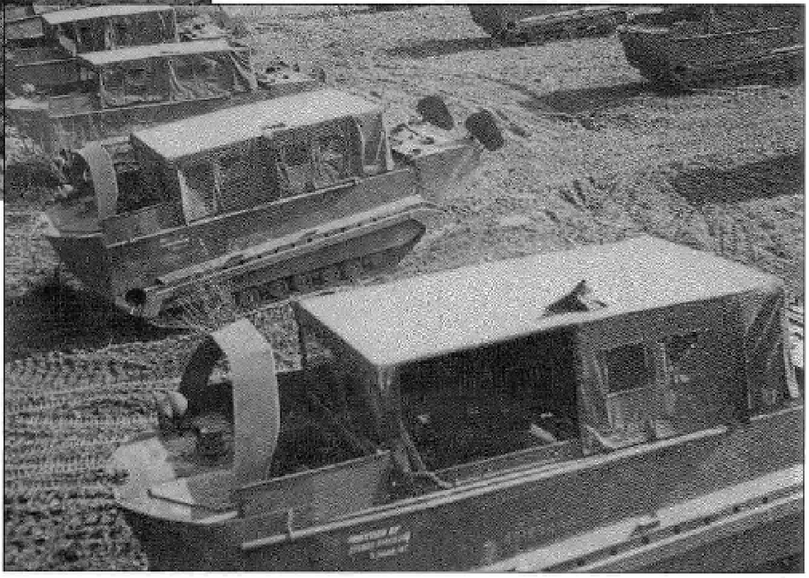
A LVT-4 amtrac comes ashore in support of the 30th Infantry Division during river crossing operations of the Wesel River in Germany on 24 March 1945. (MHI)



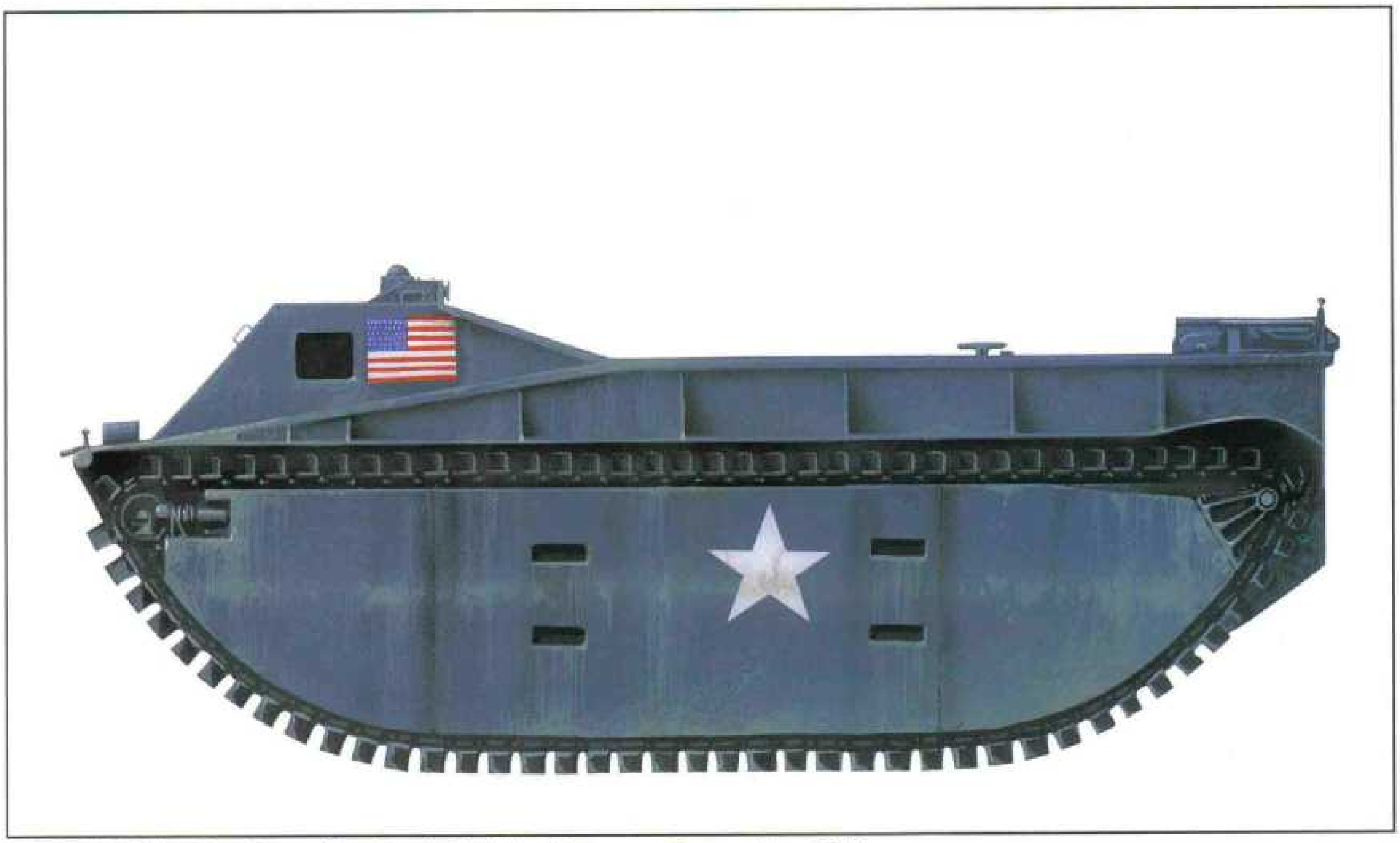
Another tracked amphibian used in the ETO was the M29C Weasel, an amphibious version of the M29 tracked utility vehicle. This Weasel is being used in a scouting role by the 255th Infantry Regiment, 63rd Division during operations near the Kocher river in Forchtenburg, Germany on 12 April 1945. In the background is a M20 armored utility vehicle. (MHI)



A close-up of a M29C Weasel in use in 1945. Compared to the basic M29, the M29C had extensions added on the front and rear to provide the vehicle with enough buoyancy to swim in water. The two rudders used for steering are partly buried in the mud in this view. (MHI)

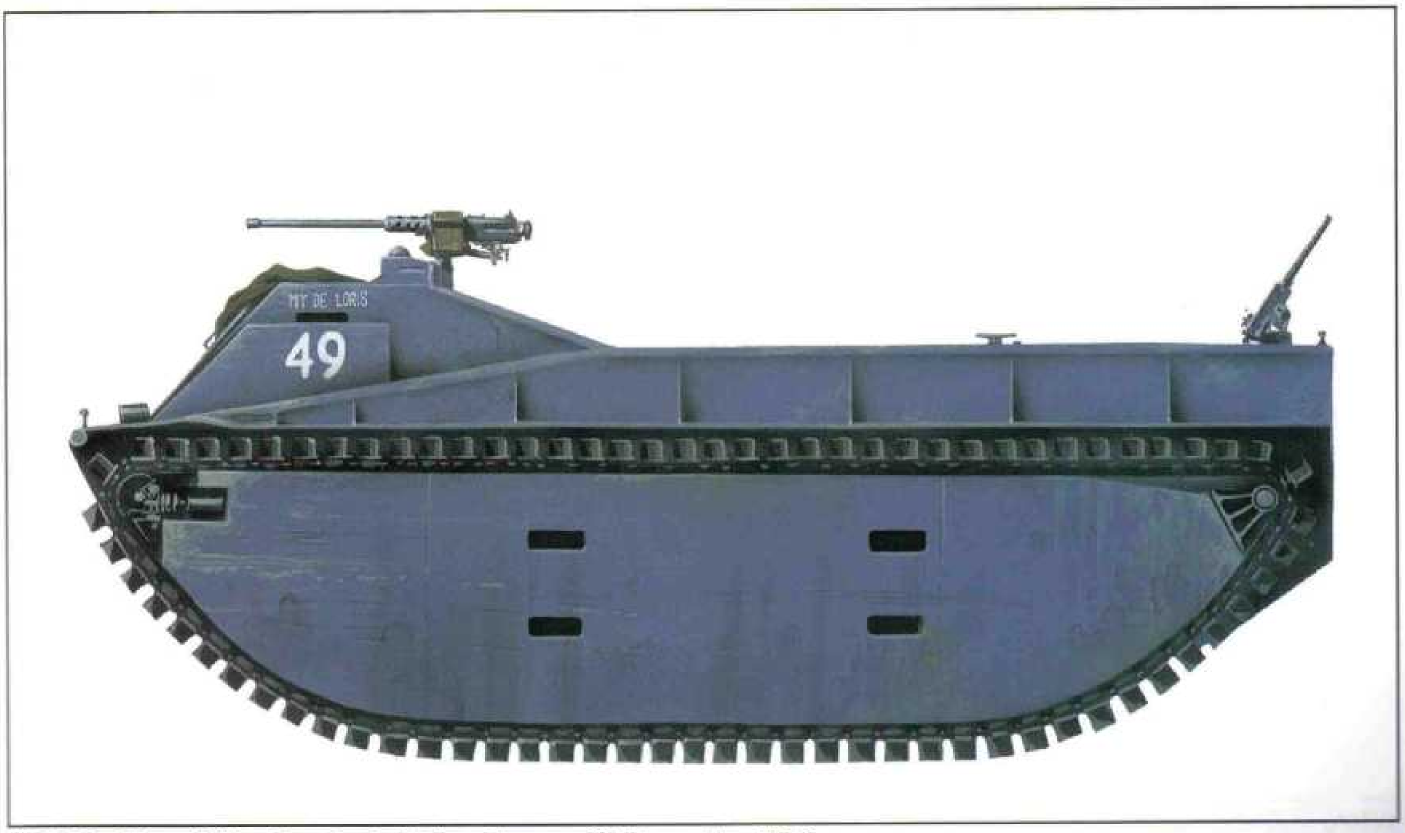


This motor pool in Germany at the end of the war shows a number of M29C Weasels with the full canvas tarp erected. The bow splash plates, designed to prevent water from flowing over the box into the cabin, have been folded upward. (MHI)



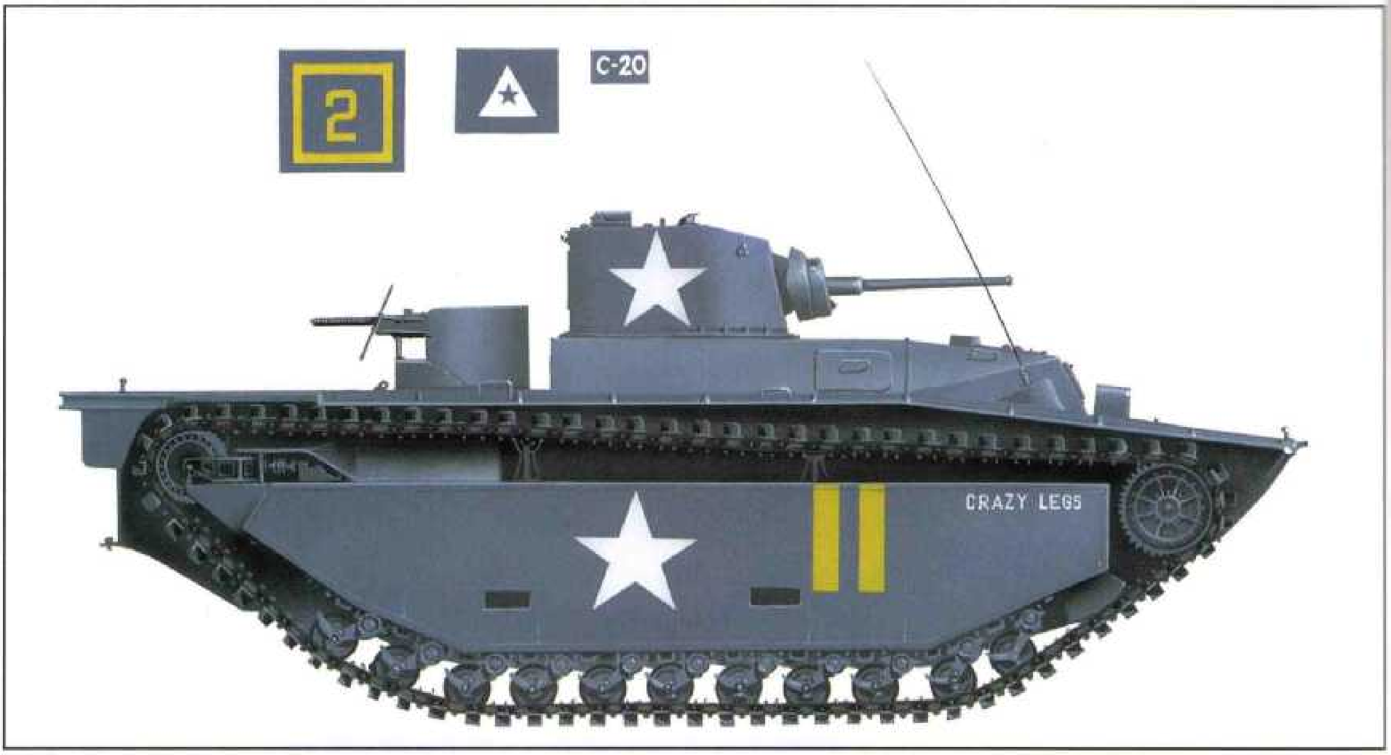
LVT-1, FMF Atlantic, Operation Torch, Fedala, Morocco, December 1942

The early LVTs were funded out of the US Navy's craft budget, and were finished like craft. The original color was 5-0 Ocean Gray, a medium slate blue-gray. An approximate color match for 5-0 Ocean Gray is FS 36173. During Operation Torch, US vehicles usually carried a prominent US flag in the hopes that the French would not fire on US troops.



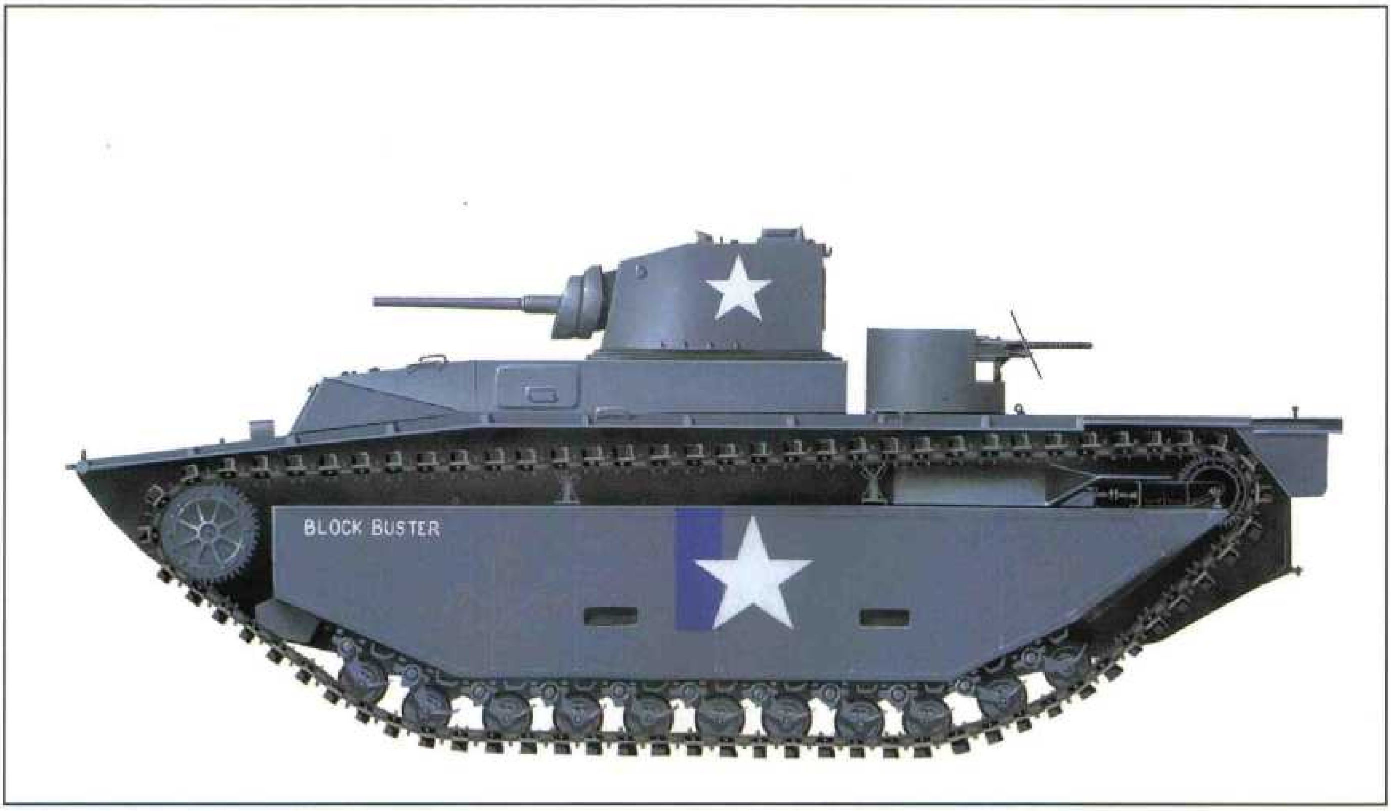
LVT-1, 2nd Amphibian Tractor Battalion, Tarawa, 20 November 1943

This was one of the LVT-1s lost on the sea wall at Betio. It is finished in the standard Ocean Gray color. A simple set of tactical markings are used, the number "49" in white, and above it, the name "MY DE LORIS".



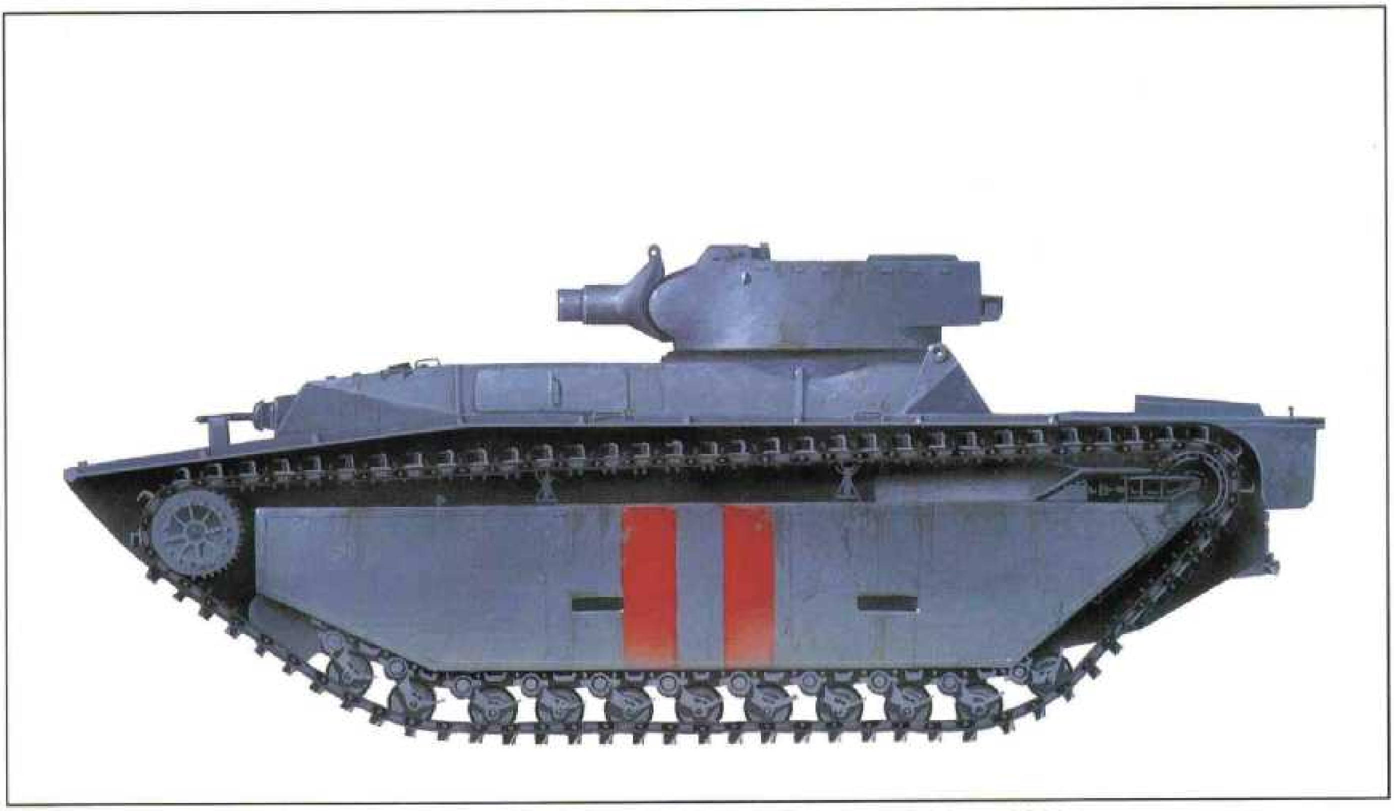
LVT(A)-1, Company C, 708th Amphibious Tank Battalion, Yellow Beach 2, Saipan, 14 June 1944

During the Saipan landing, the US Army and Marine amtracs used a standard set of beach markings. A large vertical bar was painted on the pontoon side in the beach color. The 708th Amphibious Tank Battalion was divided into its four component companies. Company B landed at Blue Beach 1, so had one dark blue stripe, Company A at Blue Beach 2 (two blue stripes); Company D at Yellow Beach 1 (one yellow stripe) and Company C at Yellow Beach 2 (2 yellow stripes). The other tactical markings are in white including the vehicle name "CRAZY LEGS", and the white stars. It is finished in the normal Ocean Gray color. By this time, the paint on these vehicles had faded, and Army troops complained that the resulting "light blue" color was unsuitable for operations on land.



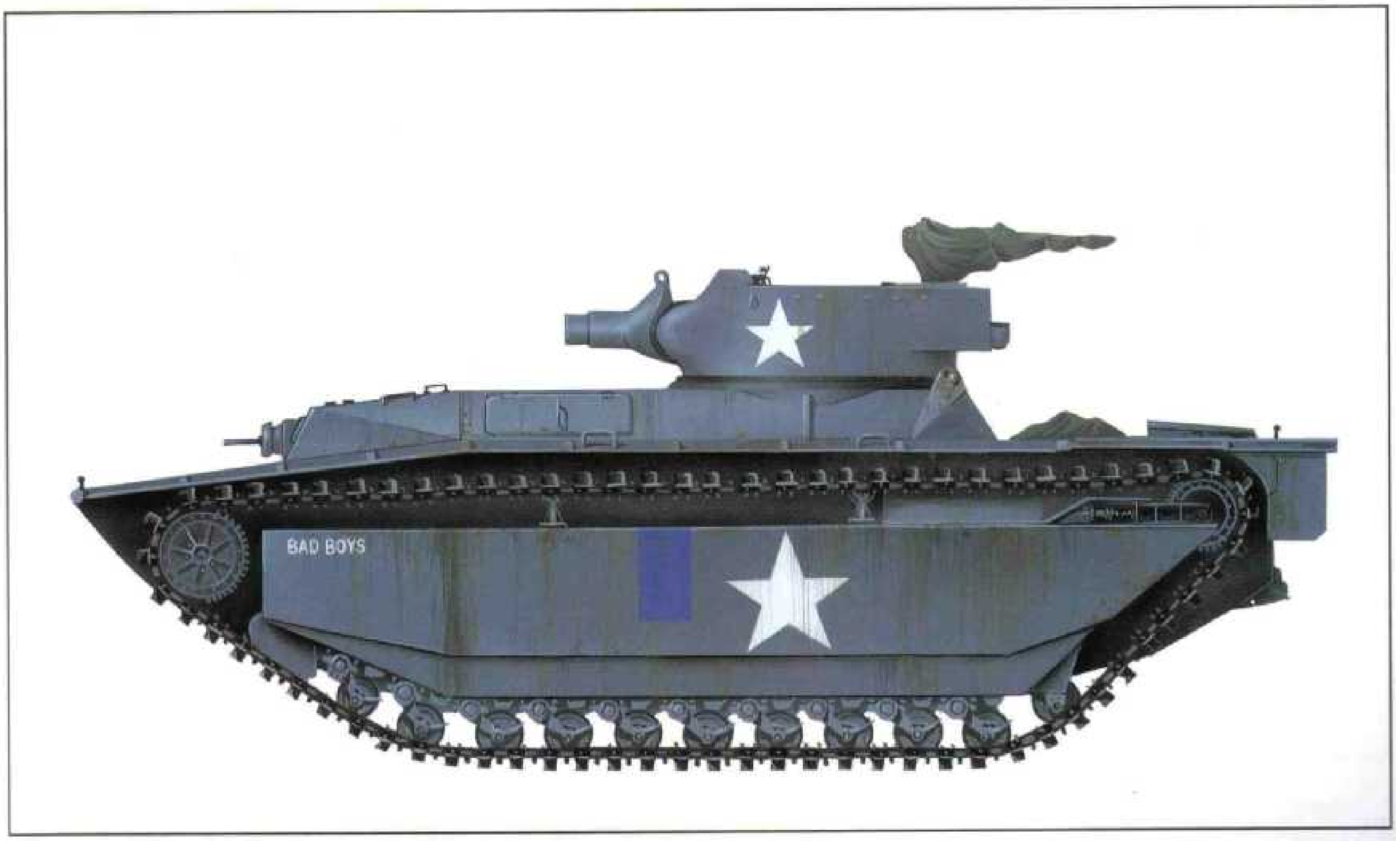
LVT(A)-1, Company B, 708th Amphibious Tank Battalion, Blue Beach 1, Saipan, 14 June 1944

This shows the variation in the beach landing markings. In this case, "BLOCK BUSTER" landed at Blue Beach 1, so there is only a single vertical blue stripe. This is almost hidden, since it is very close in color to the base Ocean Gray color of the vehicle. The extensive use of LVT(A)-1s in fighting inland was one of the reasons why amtanks and amtracs later switched to other colors.



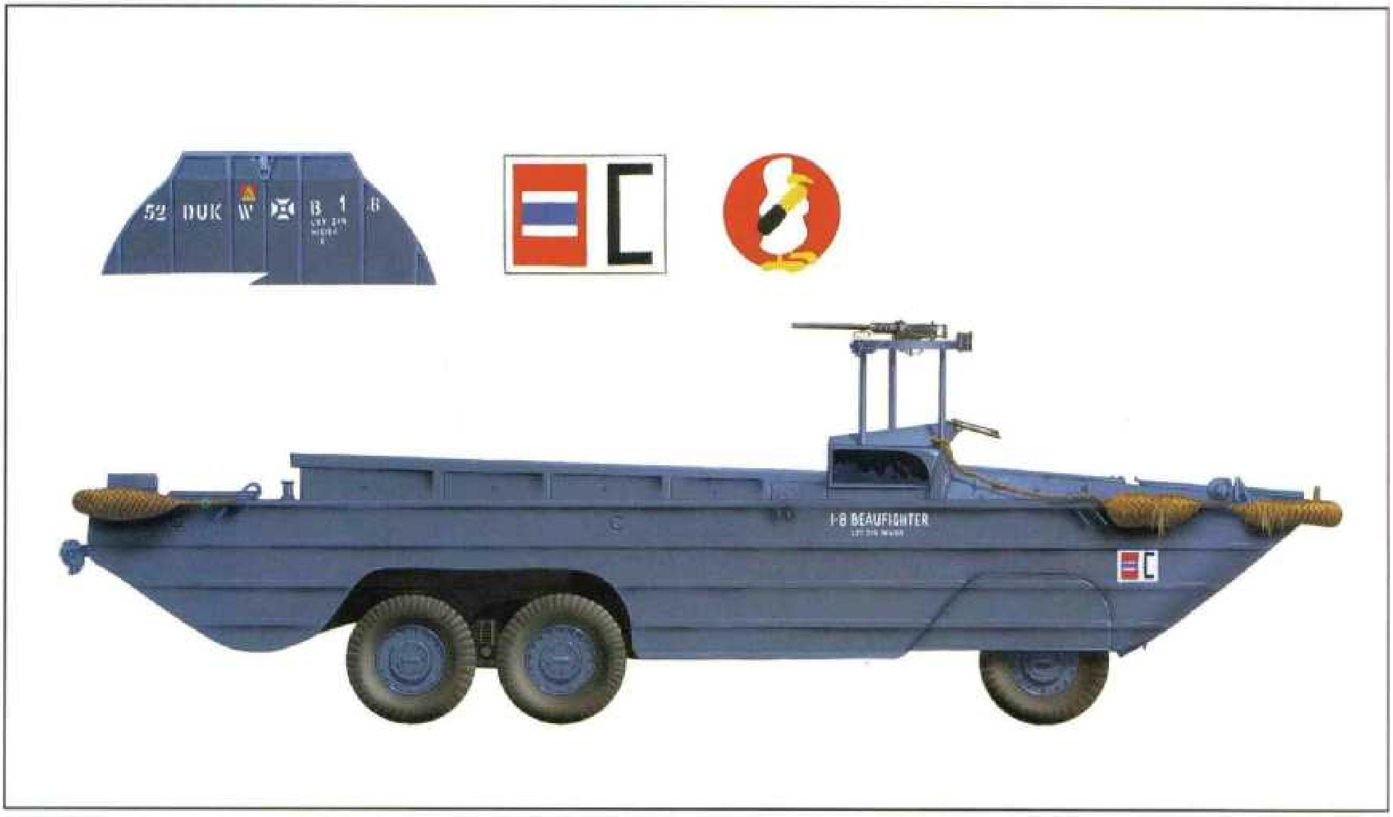
LVT(A)-4, Marine 2nd Armored Amphibian Battalion, Red Beach 2, Saipan, 14 June 1944

The Marine 2nd Armored Amphibian Battalion provided support for the northern beaches during the Saipan landings, Red Beach 1 and 2, and Green Beach 1 and 2. This is one of the new LVT(A)-4s of the battalion from Red Beach 2 with the two vertical red stripes. The Marine amtanks generally did not carry the Army's white star insignia on their vehicles. These vehicles are still in the Ocean Gray color.



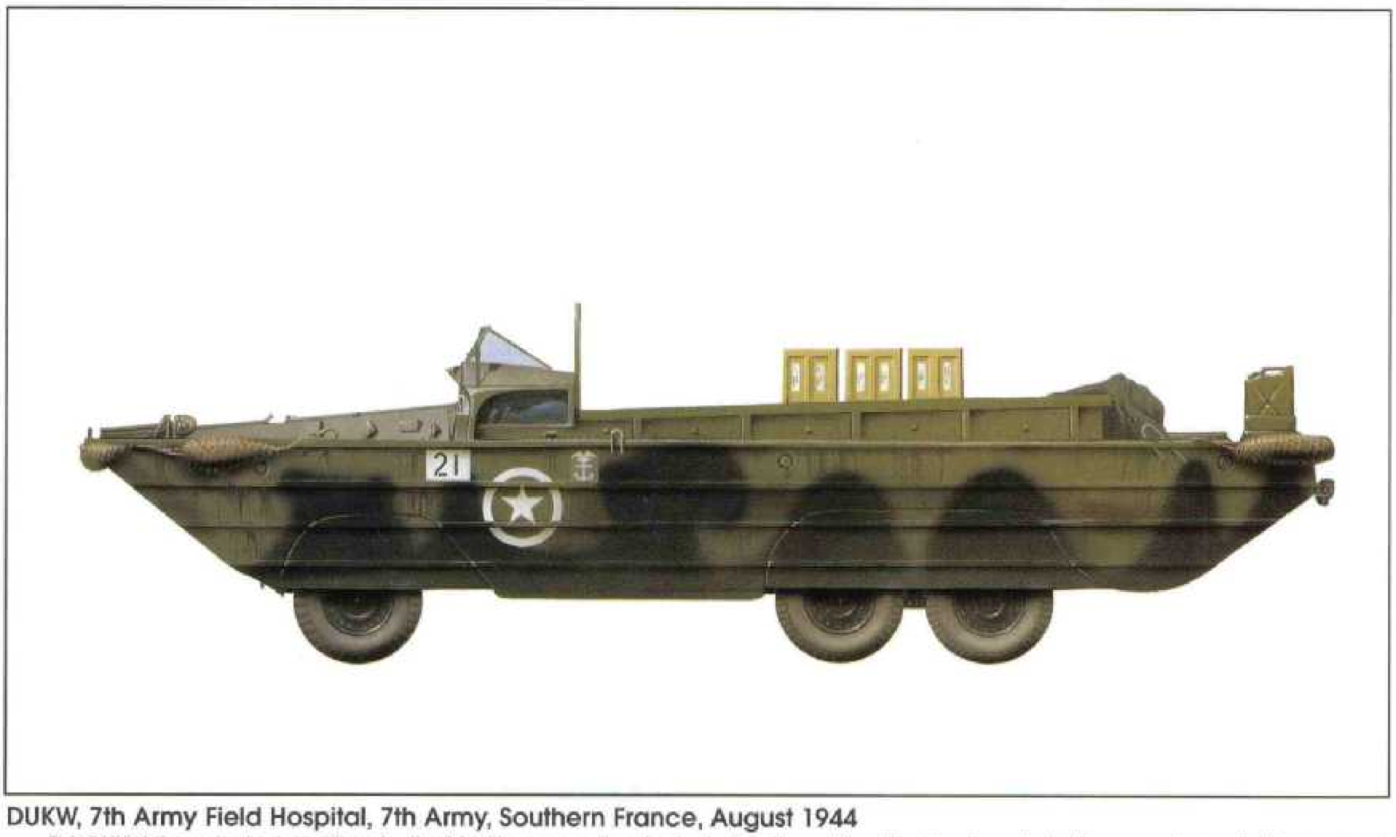
LVT(A)-4, 708th Amphibious Tank Battalion, Blue Beach 1, Saipan, 14 June 1944

This provides another example of the mid-war amtank scheme of Ocean Gray, but this time on one of the new LVT(A)-4 amtanks in Army service. This uses the usual beach markings, a vertical blue band for Blue Beach 1. The vehicle name is "BAD BOYS" and the unit code is "B-2".



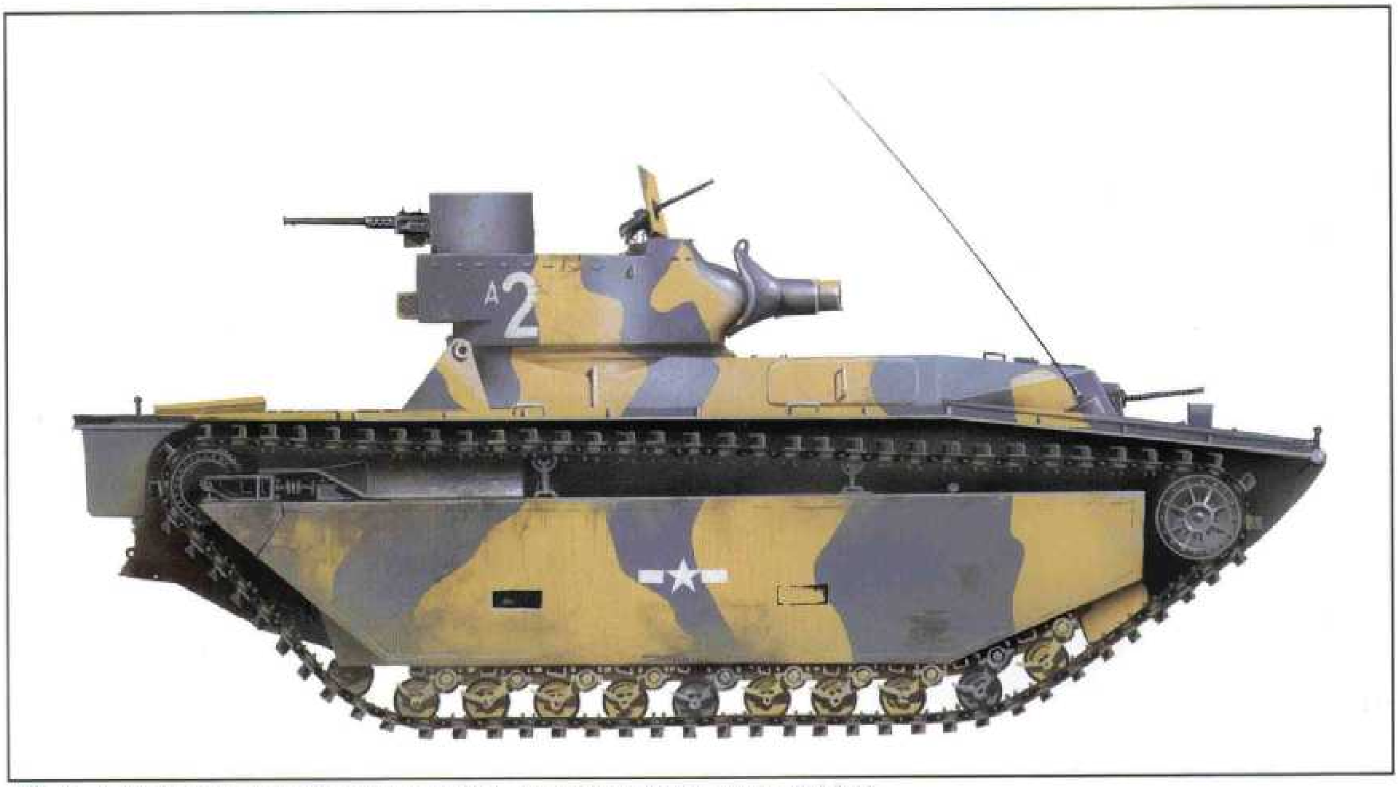
DUKW, Company B, 52nd Quartermaster Battalion, 7th Army, Southern France, August 1944

This DUKW battalion carried names following the company letter, so one of the Company A DUKWs was "Anna", while this one from Company B is "Beaufighter". The number "1-8" indicates its platoon and individual number. On the side of the driver's compartment is a carton of a boxing duck. The insignia on the bow is the normal unit identification bar code, although instead of the usual separate bars, the center blue bar is within the red bars and with a white line separating.



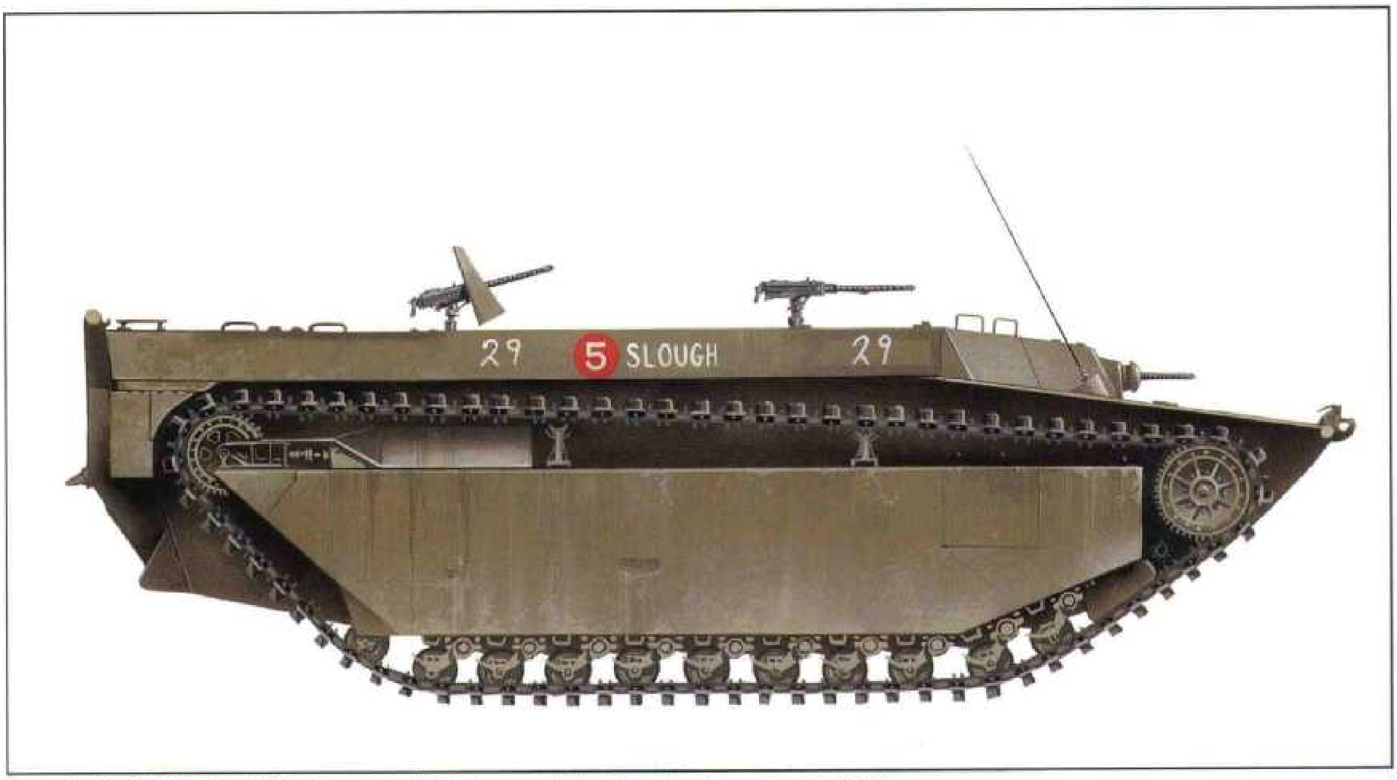
DUKW, 7th Army Field Hospital, 7th Army, Southern France, August 1944

This DUKW shows typical markings for the Mediterranean theater, including the white allied star in a circle. It is camouflaged with a sprayed on pattern of black over olive drab. This particular scheme was developed at the Tank Automotive Center at the Fisher Building in Detroit and approved in March 1943. The vehicle number is stenciled in black on a white rectangle.



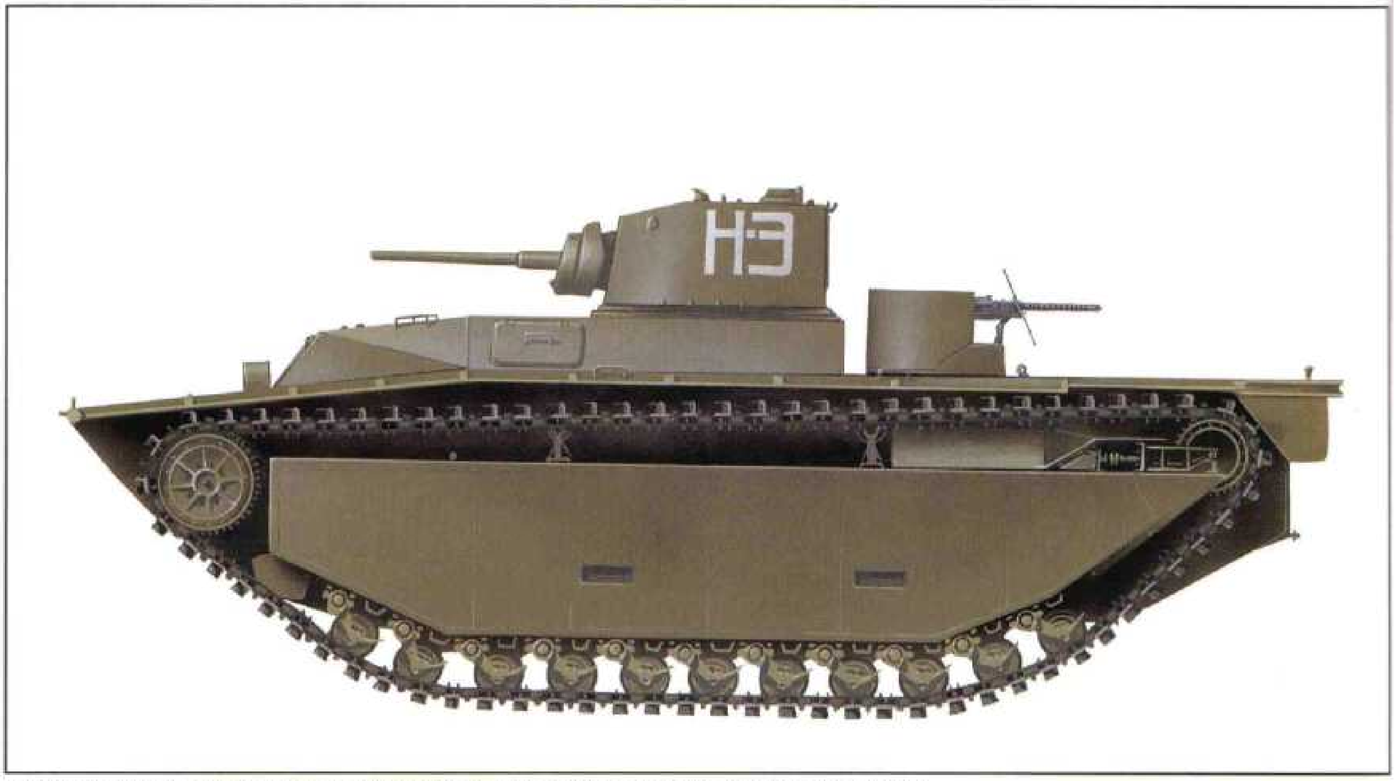
LVT(A)-4, Marine 2nd Armored Amphibian Battalion, Tinian, August 1944

Armored vehicles of some Marine armor units used their own form of national insignia, a white star with two white wings, looking like a miniature version of the insignia worn on Marine aircraft. Following the Saipan fighting, there were immediate steps taken to camouflage paint amtanks. The source of the color and the precise scheme are not known. It seems likely that this pattern consisted of large areas of light sand color over the normal Ocean Gray color. The tactical code on the turret is a small A and the vehicle number 2, indicating Company A.



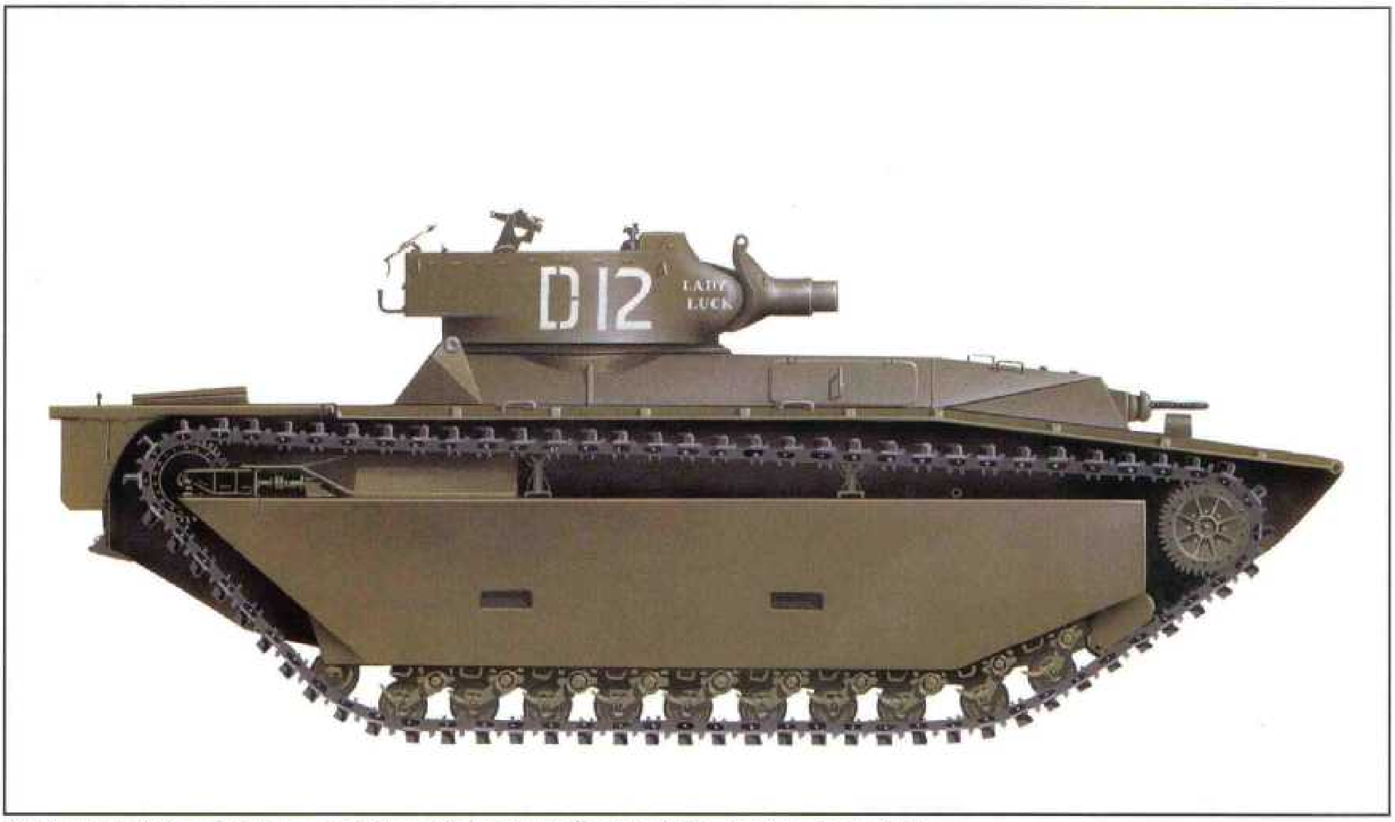
Buffalo IV, 11th RTR, 79th Armoured Division, Netherlands, November 1944

Markings on the Buffaloes of "Hobart's Funnies" were very simple. On the hull side and on the upper rear center of the drop ramp were the squadron insignia, a white 5 in a red circle indicating 5 Troop, C Squadron. In front of it is the vehicle name, "SLOUGH". All of the Buffaloes of this unit carried names starting in S. The vehicles sometimes carried the divisional insignia and arm of service square (in this case, white 52 on a red square), but during operations, these were often painted over. The vehicle is either in its original US olive drab, or the essentially similar British Shade No. 15 olive drab.



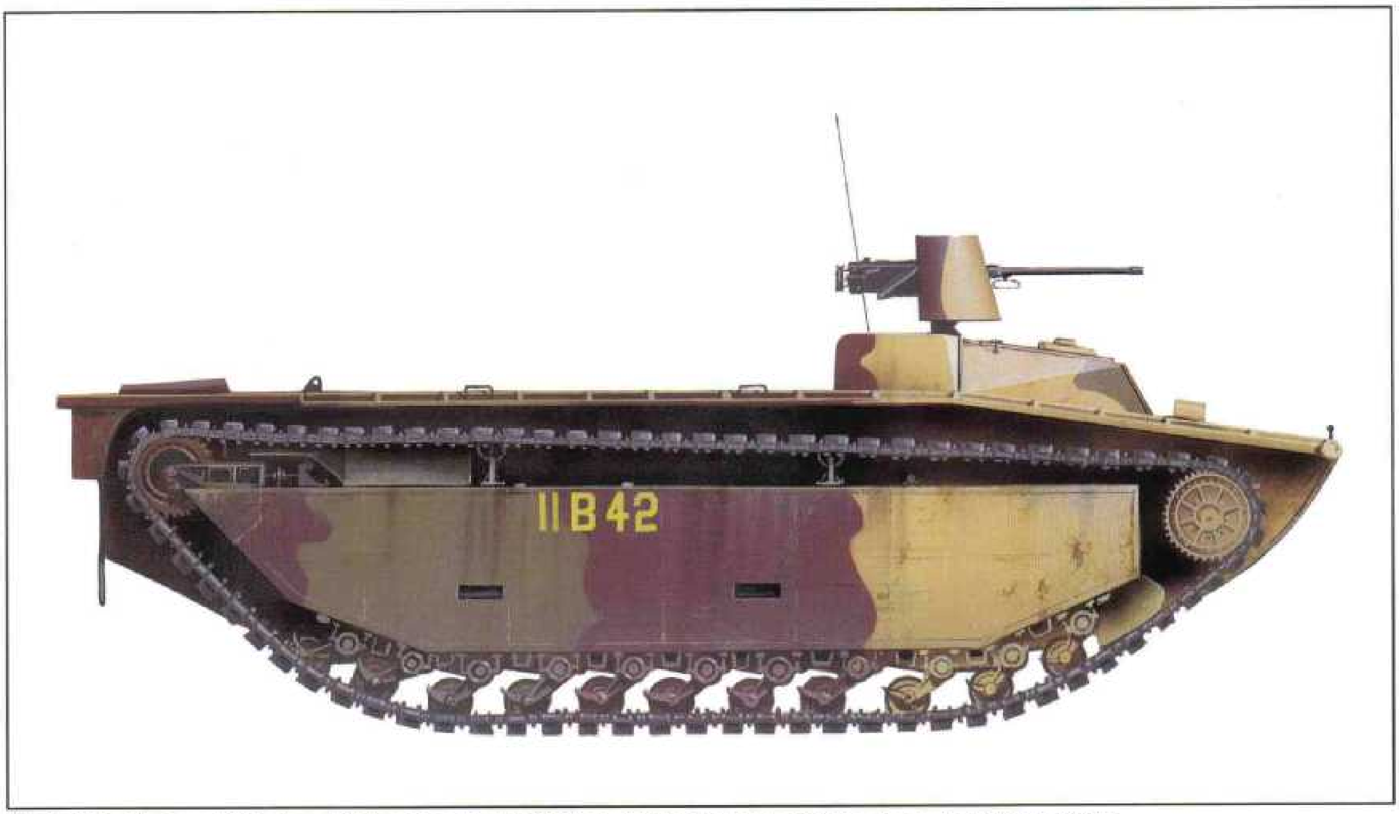
LVT(A)-1, Marine 3rd Armored Amphibian Battalion, Peleliu, September 1944

After complaints from Army and Marine units about the unsuitability of the Ocean Gray color once amtracs were on shore, in May 1944, amtracs undergoing repainting were finished in normal olive drab, and new production vehicles shifted to this color as well. In this case, this Marine LVT(A)-1 has been repainted in the new olive drab finish. The tactical marking, "H-3", is in white. The tactical designation "H-3" suggests the vehicle was part of the headquarters company. In contrast to Saipan, the Marines do not appear to have made extensive use of beach color bars at Peleliu.



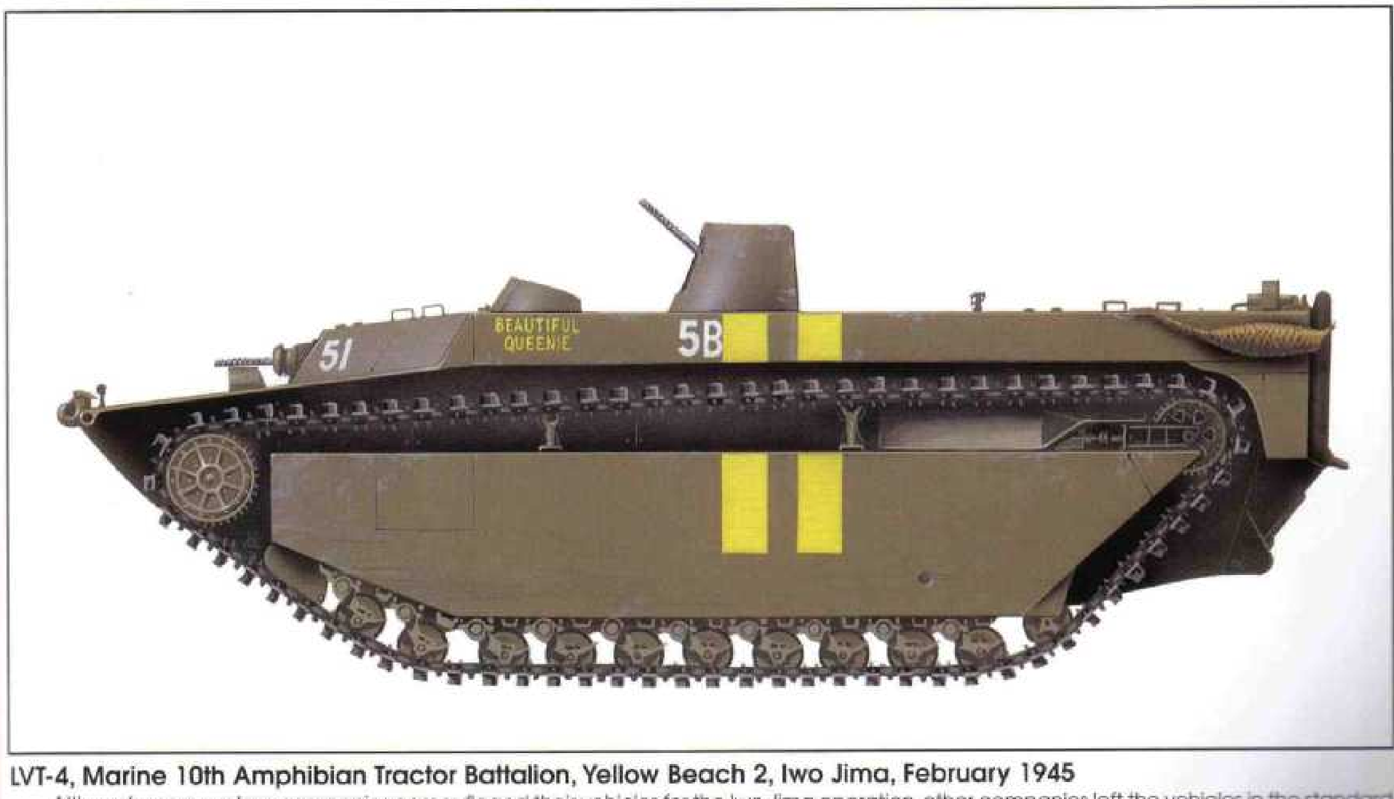
LVT(A)-4, Marine 3rd Armored Amphibian Battalion, Peleliu, September 1944

This is an amtank from Company D, with the normal style tactical markings. The unit found that these drew unwanted attention, and during the fighting on Peleliu, many amtanks had these markings painted over, or obscured with dirt or engine grease. These amtanks were probably finished in the new olive drab scheme.



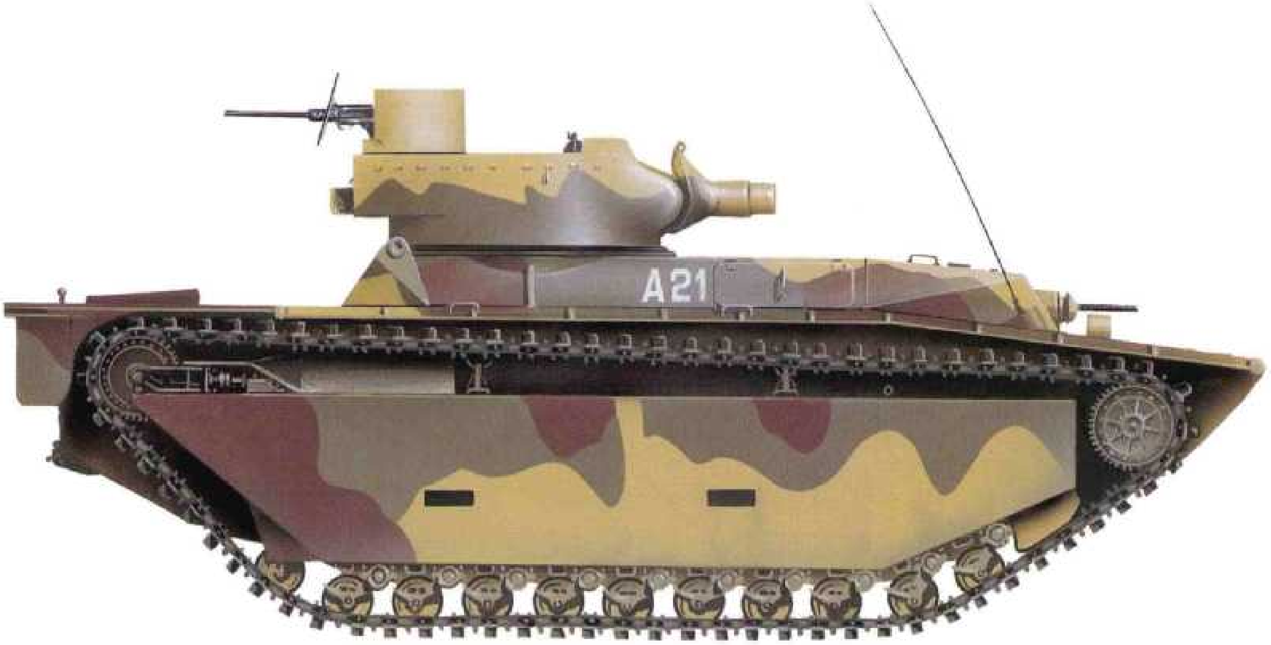
LVT(A)-2, Marine 10th Amphibian Tractor Battalion, Yellow Beach 2, Iwo Jima, February 1945

This LVT(A)-2 is finished in a typical three color scheme from Iwo Jima. Surviving color film from the battle indicates that the most common scheme was a pattern of sand and red brown over the normal olive drab, which are most likely the colors here. The two vertical bars on this vehicle are not the number "11" but rather the reduced visibility beach landing bars for Yellow Beach 2 where the Marine 4th Division landed. The vehicle tactical number is "B-42" and is also in yellow. There were four Marine amphibian tractor battalions at Iwo Jima, the 3rd, 5th, 10th, and 11th.



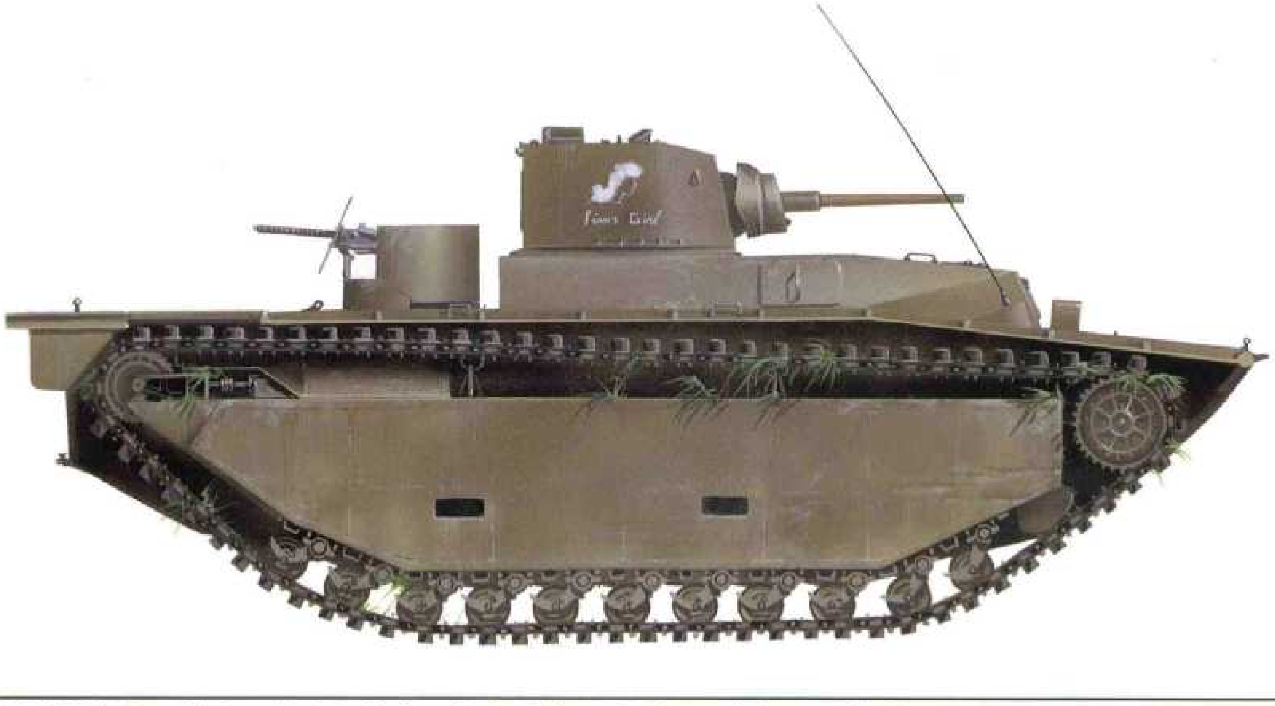
LVT-4, Marine 10th Amphibian Tractor Battalion, Yellow Beach 2, Iwo Jima, February 1945

Although some amtrac companies camouflaged their vehicles for the Iwo Jima operation, other companies left the vehicles in the standard overall olive drab finish. This LVT-4 was named "BEAUTIFUL QUEENIE", like all markings, in yellow. It carries the two yellow beach stripes. The vehicle tactical number "51" is carried on front, and a second tactical number "5B" on the side. The beaches at Iwo Jima were Green, Red 1 and 2, Yellow 1 and 2, and Blue 1 and 2.



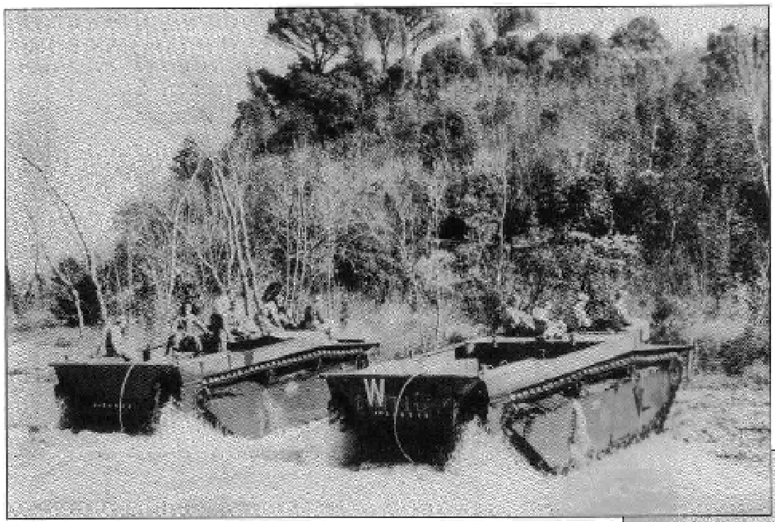
LVT(A)-4, Marine 2nd Armored Amphibian Battalion, Iwo Jima, February 1945

Many of the Marine vehicles at Iwo Jima wore a three color scheme of olive drab, sand and red-brown as is also the case here. By this stage in the war, the use of large tactical markings on the side of the turret and hull had become less common since the Marines felt that they made too conspicuous an aiming point. As a result, they tended to be carried in a much smaller size on the superstructure and on the hull rear plates. The usual style was simply the company letter and two-digit tactical number in white or yellow, in this case, "A21" in white.

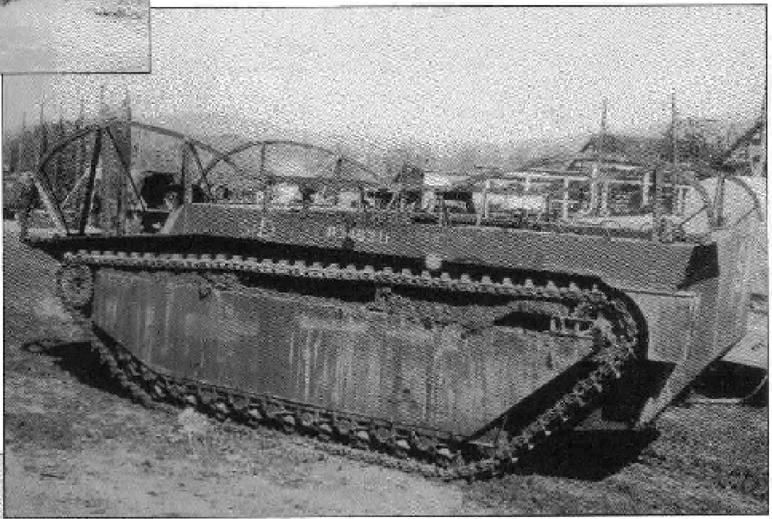


LVT(A)-1, 708th Amphibious Tank Battalion, Keise Shima, Ryukyus, February 1945

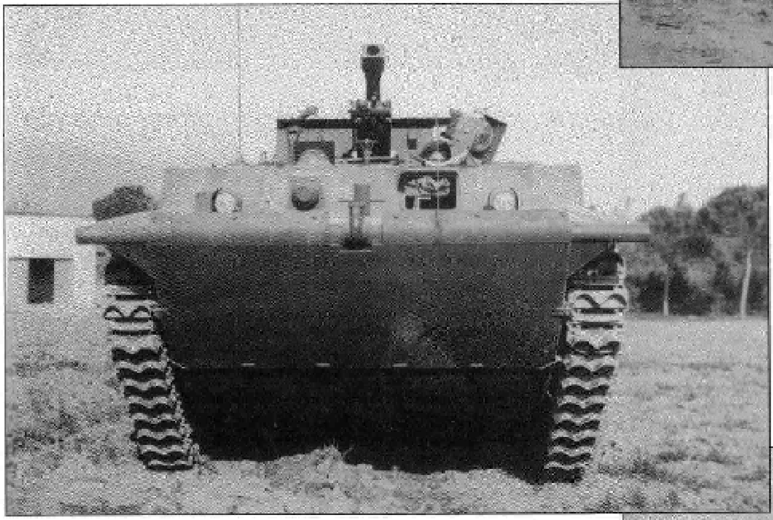
By this stage in the war, the 708th Amphibious Tank Battalion's old LVT(A)-1 amtanks had been repainted in olive drab. This particular one lacks the pervious large white stars. On the turret sides is a drawing of a woman's head and the name "JIM'S GIRL" below.



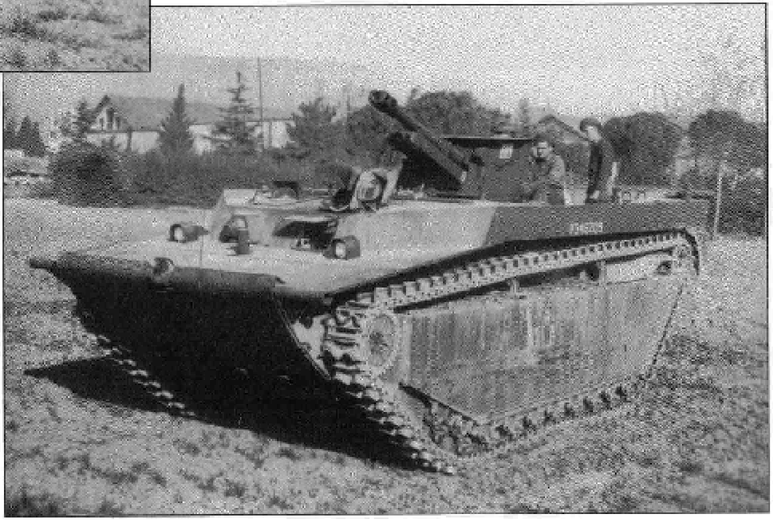
In the late winter of 1944-45, the British Eight Army in Italy began to receive shipments of Buffalo IV (LVT-4) amtracs for possible use in operations in the salt-water lagoons along the Adriatic coast on the approaches to Venice. This is a pair of vehicles assigned to the British Headquarters #1 District Testing Unit in Perugia, Italy, where the amtracs were prepared for the operations. These were used to form the special RASC Regiment, formed from tank drivers of the 27th Lancers and transportation units. The W on the rear indicates W Squadron, one of six squadrons in the unit. (US Army)



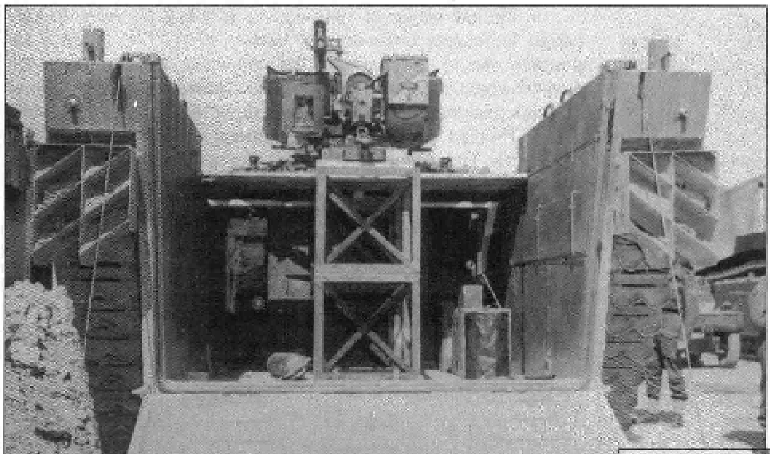
The British Eighth Army in Italy benefited from experiences of the 79th Armoured Division in the Netherlands in the development of specialized variants. This particular Buffalo IV has a set of frames over the top which held log mats that were placed over muddy areas to assist the other vehicle in traversing soft ground. The term "Fantail" was used in Italy as a cover name for the amtracs, as by then, German intelligence was already familiar with the term Buffalo from the Netherlands fighting. (US Army)



One of the lessons of the Scheldt fighting was the need for fire support of the amtrac attack. This is a Buffalo IV fitted with a 25 pdr. for direct fire support during the fighting along Italy's Adriatic coast. X Squadron had 16 Fantails with 25 pdrs. Three of the Squadrons (W, Y, Z) were troop carrying squadrons each with 38 amtracs. S Squadron was the technical support squadron and R Squadron was the HQ. (US Army)

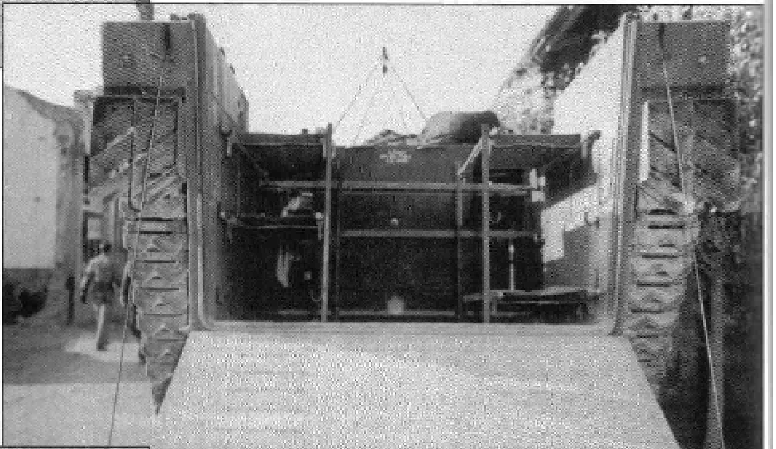


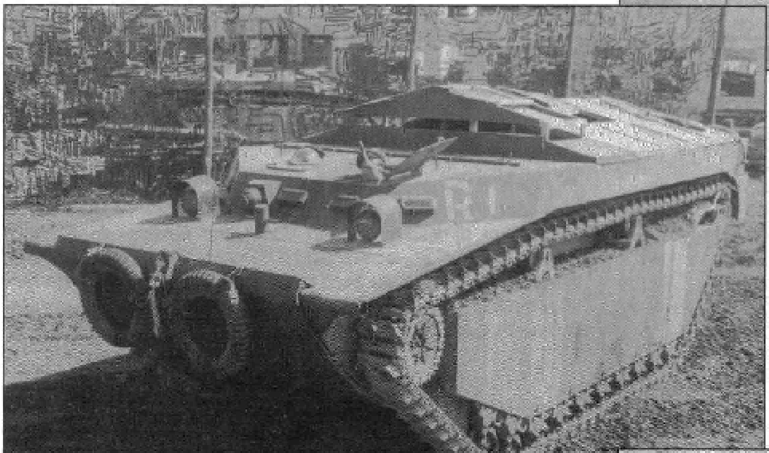
Another view of a Buffalo IV of X Squadron carrying a 25 pdr. for fire support of amtrac operation in Italy. This was taken in the Perugia area in the early spring of 1945 before the Comachio lagoon operation. (US Army)



Another type of support vehicle was built by mounting an old 2 pdr. anti-tank gun inside the bay of a Buffalo IV. As can be seen here, the gun's trails were removed, and the gun was mounted on a new frame at the Perugia facility. (US Army)

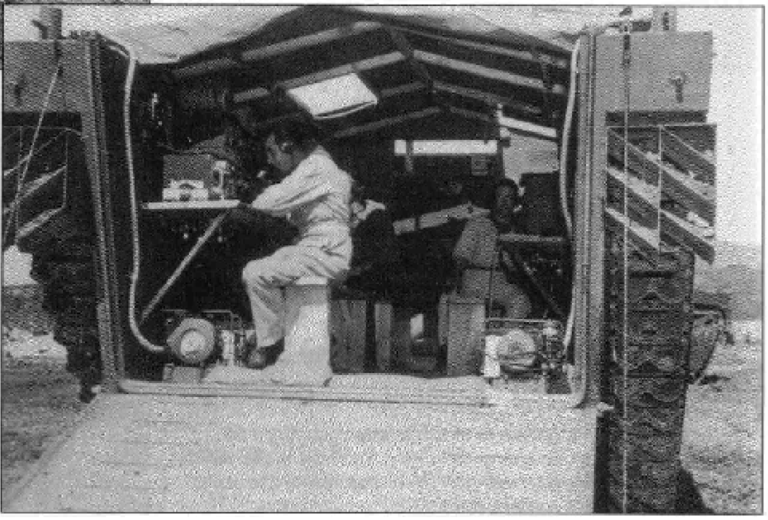
The British Army developed its own ambulance version of the Buffalo IV, placing litters on special frames to increase the number of casualties that could be evacuated. These were used by S Squadron. (US Army)



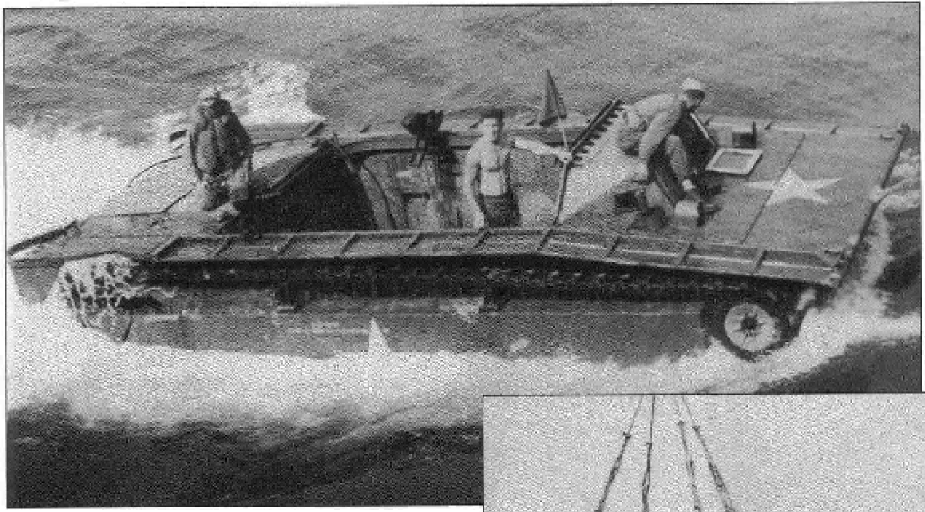


A special radio command version of the Buffalo IV was built for operations along the Adriatic for use by R Squadron. A canvas and wood frame assembly was erected over the rear bay to protect the radios from water. (US Army)

An interior view of a Buffalo IV radio command vehicle assembled at Perugia, Italy in March 1945. This shows that the vehicle had generators added to power the radios when the vehicle engine was turned off. (US Army)

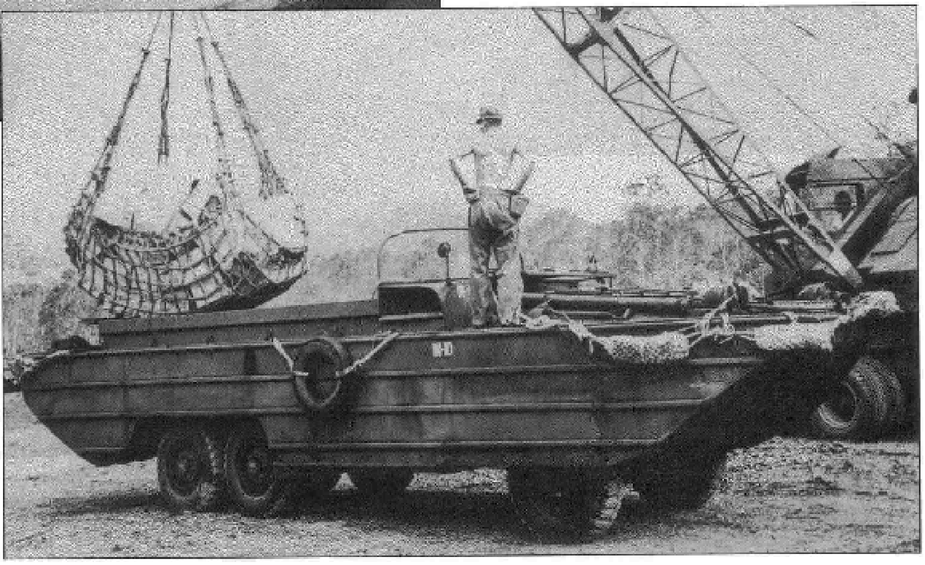


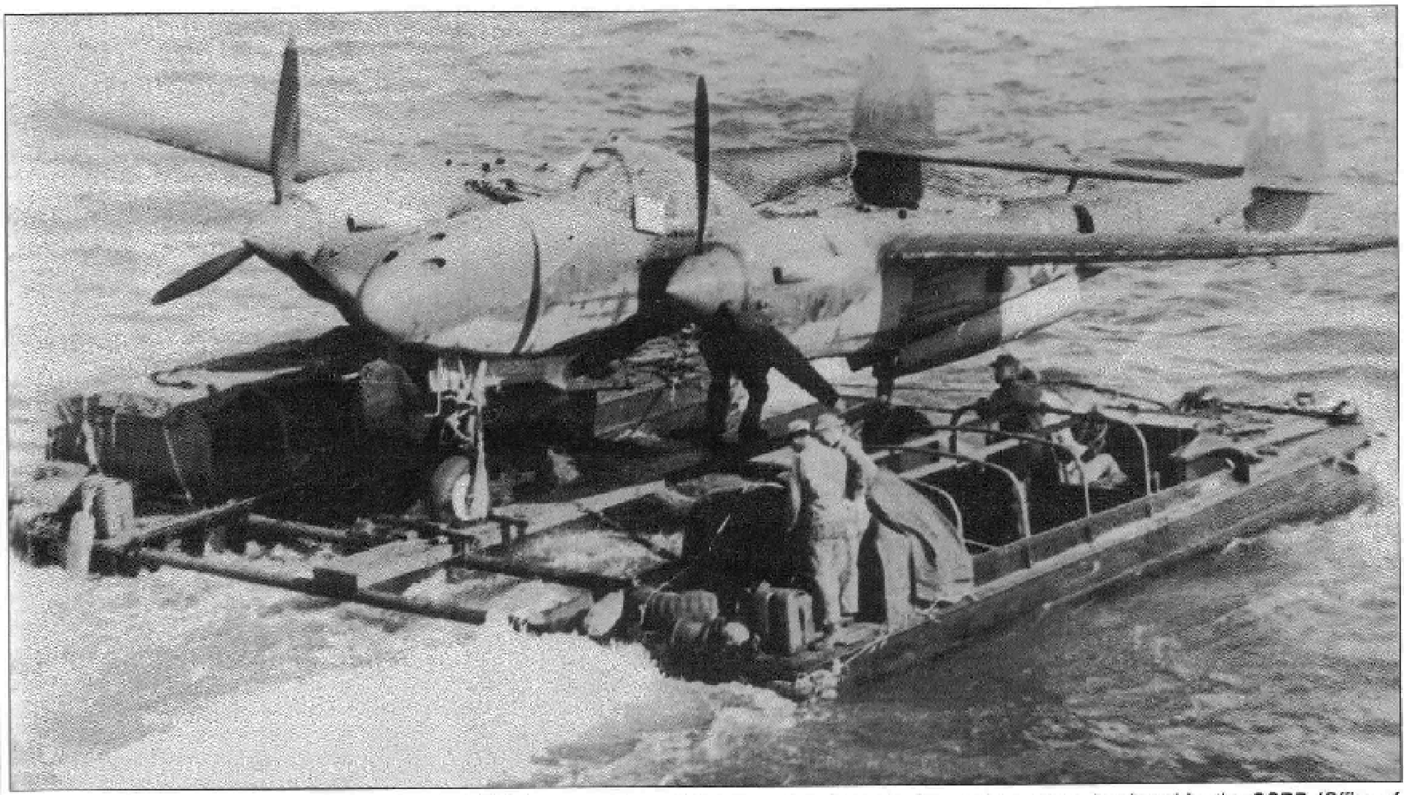
Amphibians at War in the Pacific 1943-45



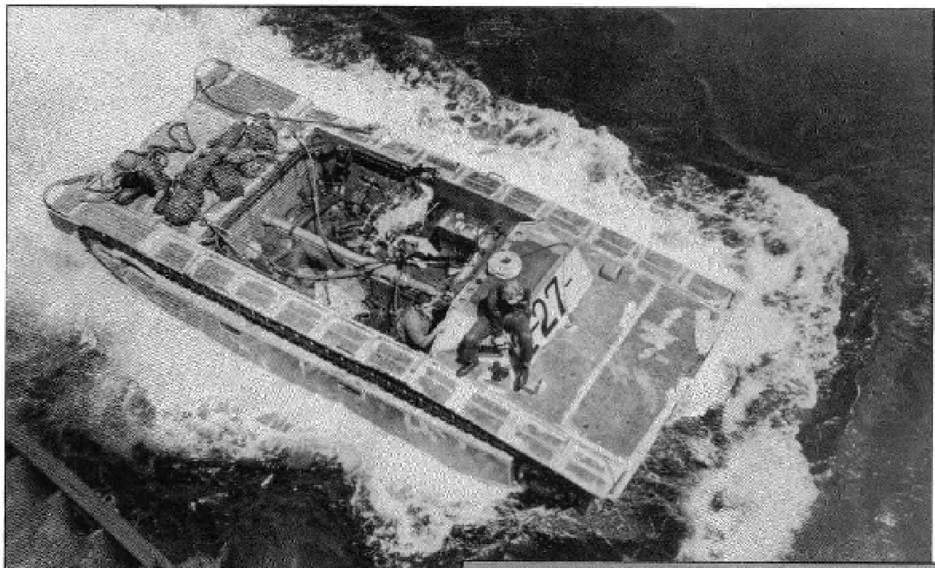
One of the new LVT-2 amtracs takes part in an exercise at Pearl Harbor in 1944. Judging from the markings, this is an US Army vehicle. (US Navy)

Although not as vital as in the ETO, the DUKW was widely used in the Pacific as well. Here, one is loaded with cargo on New Caledonia on 25 April 1943. (MHI)



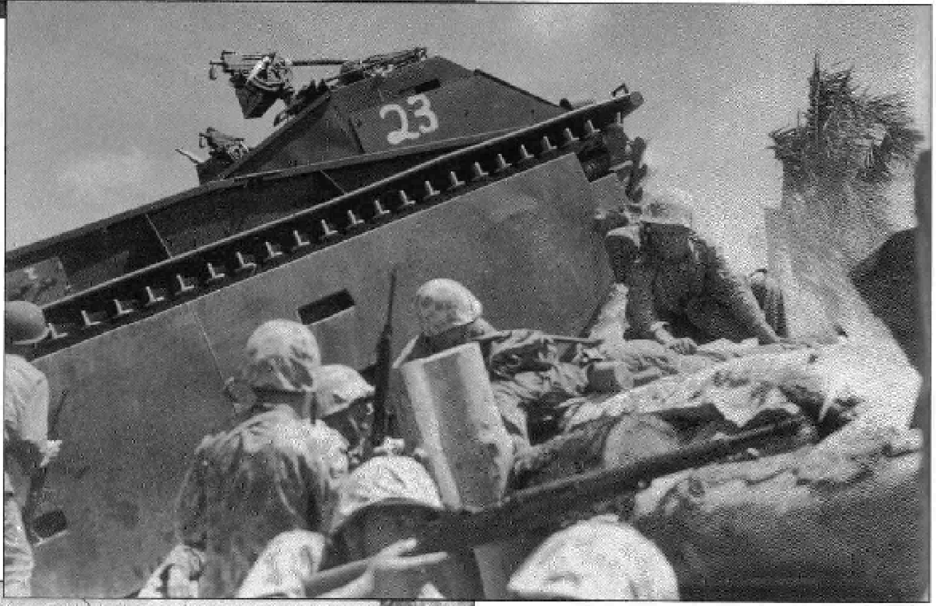


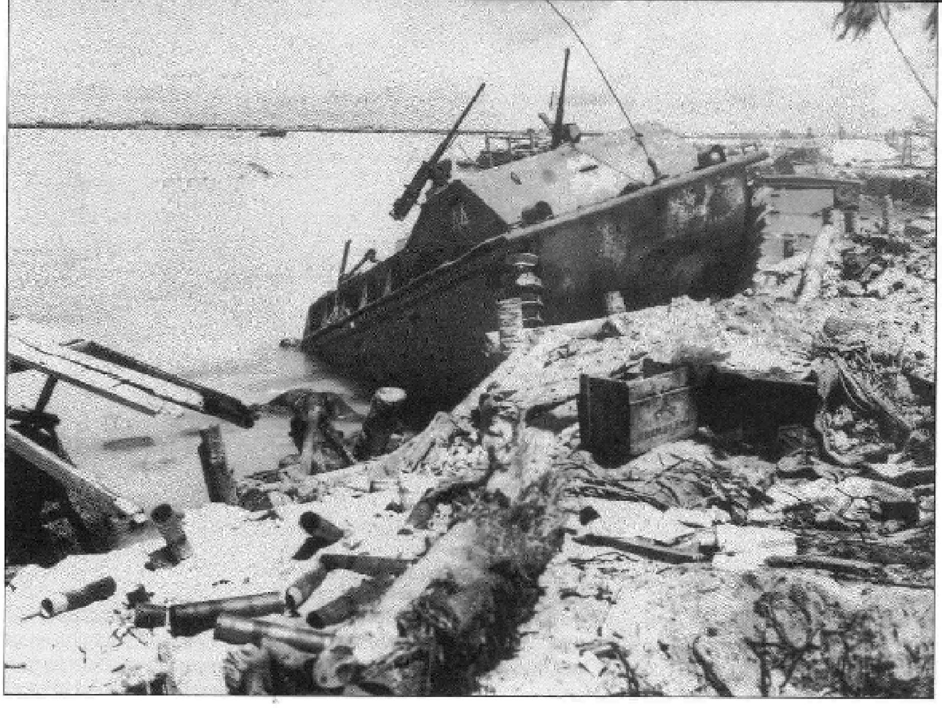
One of the more curious applications for the DUKW was as a ferry. This was not an improvisation, but a system developed by the OSRD (Office of Scientific Research and Development). The two DUKWs were joined in the center using a treadway to form a "plane ferry", here seen carrying a P-38 fighter. (MHI)



. The amtrac's first test of battle came at Tarawa on 20 November 1943. This is one of the new LVT-2 amtracs seen from on board one of the transport ships shortly before the landings. Notice that a sheet of armor plate has been added over the front of the driver's compartment, with the number "27" painted on. (USMC)

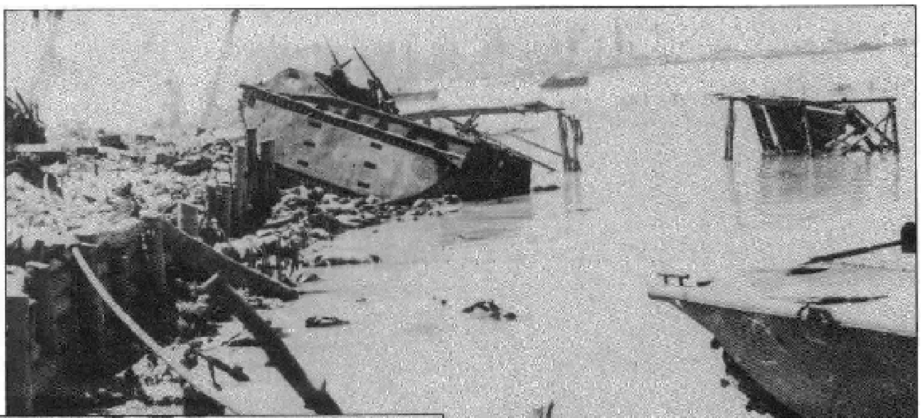
A view along the hotly contested sea wall at Red Beach 3 at Betio on 20 November 1943 with a LVT-1 knocked out in the background. Notice that armor plate has been added around the driver's compartment. In spite of the armor, losses of the amtracs near the sea wall was very heavy. (USMC)

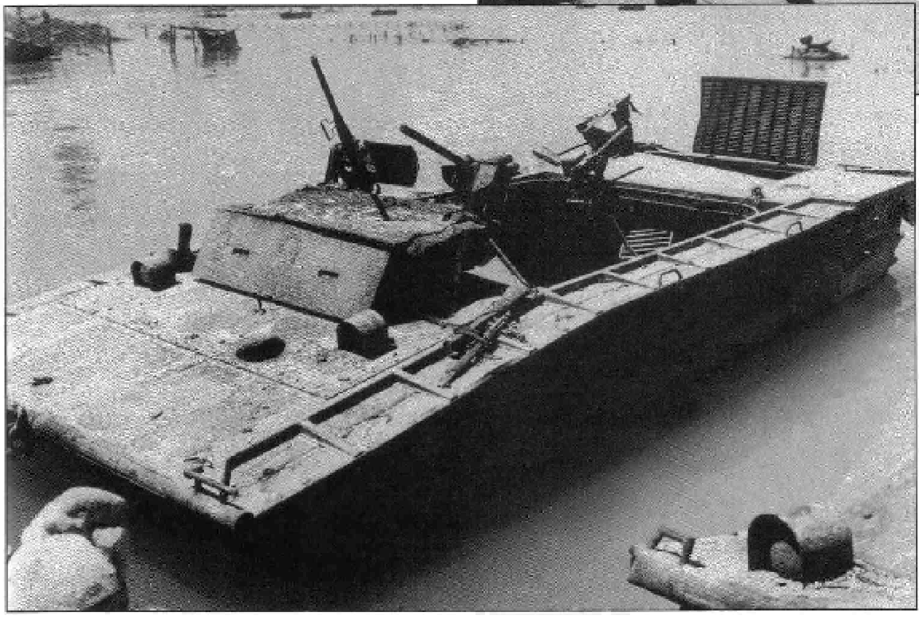




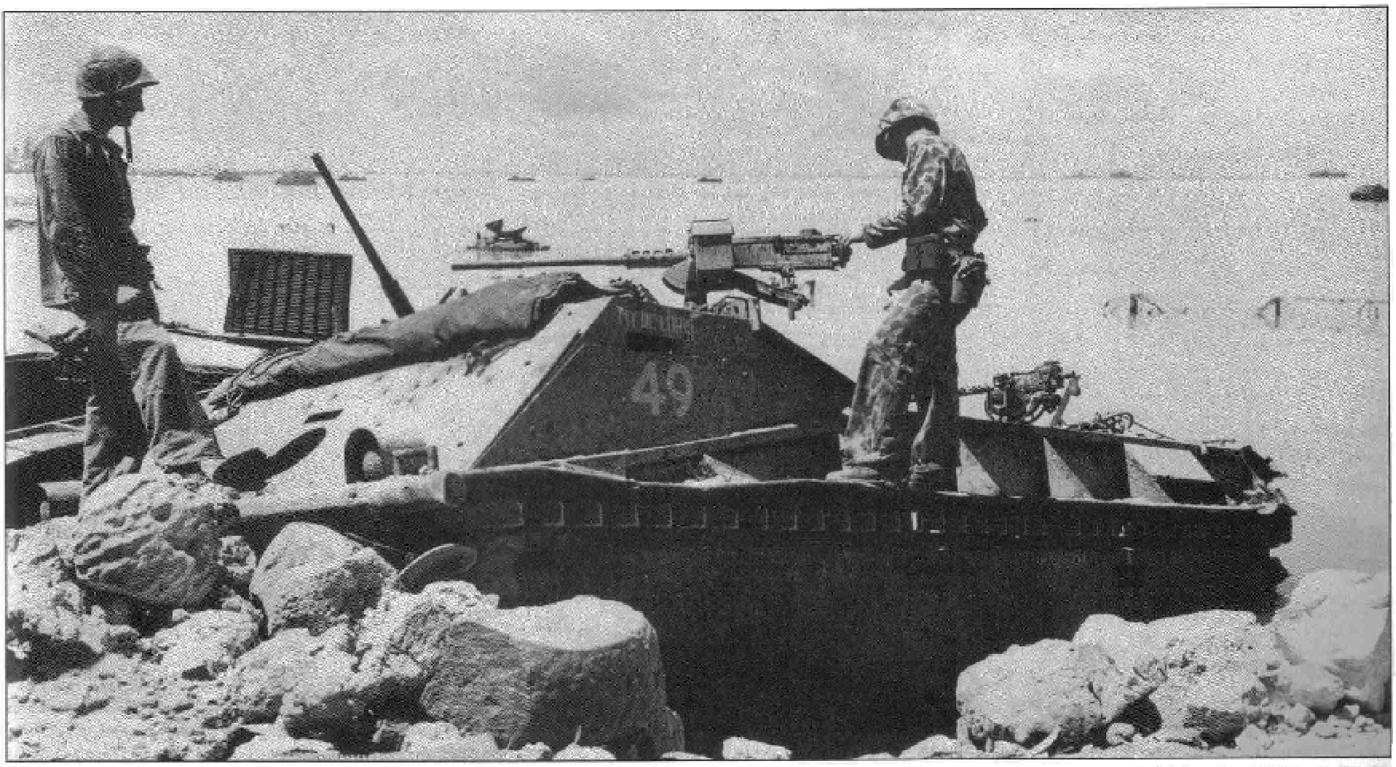
A view of another LVT-1, number "44", knocked out while trying to climb out of the seawall. Many amtracs had additional .50 cal machine guns added, in order to provide last minute fire support during the run into the beach. The attack came from the lagoon side, and portions of the Tarawa atoll can be seen in the background. (USMC)

Another view of LVT-1 number "44", taken from the other side after the fighting on 20 November 1943. Although the coconut log seawall made it nearly impossible for the amtracs to crawl out of the lagoon, it offered invaluable protection for the exposed Marine troops. The bow of a LVT-2 can be seen to the right, knocked out with a hit on the nose. (USMC)

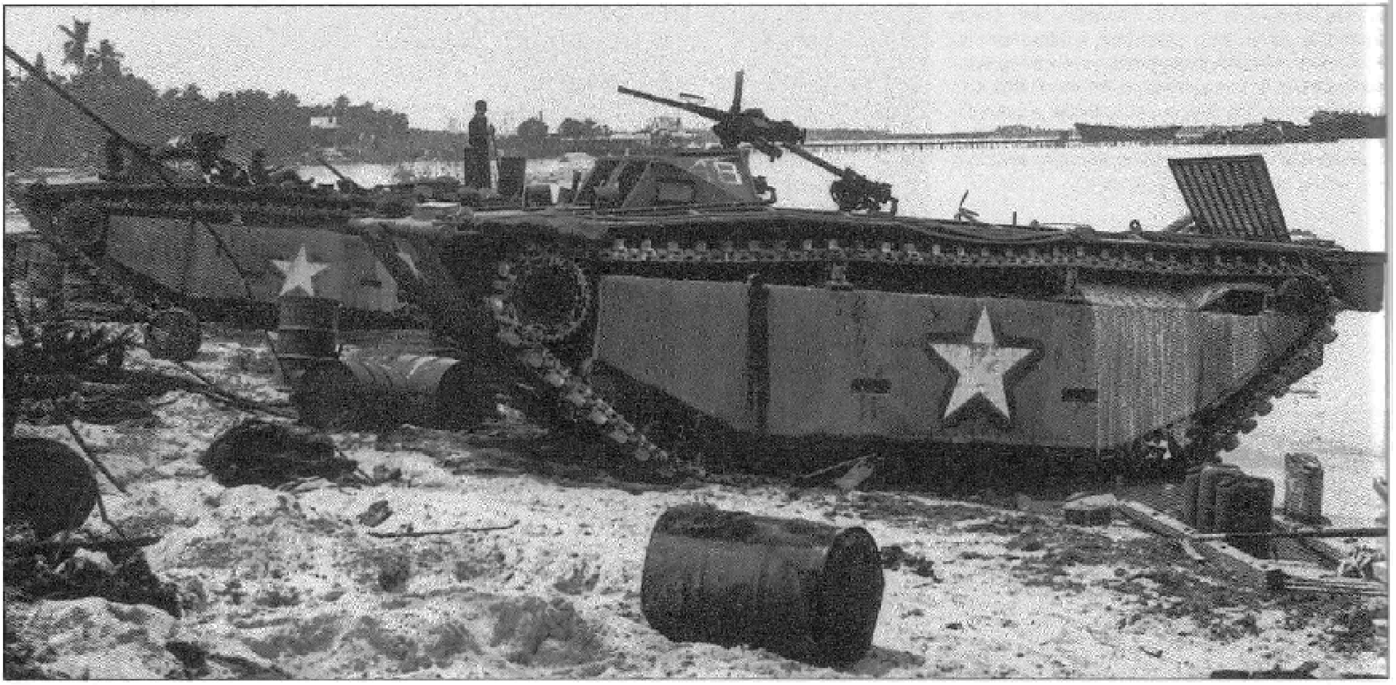




LVT-2 number "29" is seen here, knocked out in the lagoon after the first day's fighting. It has taken at least two hits, a gun hit near the bow, and a larger hit, probably from a mortar, immediately in front of the driver's compartment. The vehicle has completely burned out, and the vehicle tactical marking can barely be seen. Careful inspection of the photo reveals the top of the turret of one of the Marine M4A2 medium tanks that sank in a shell hole, visible immediately above the open vent cover of this amtrac. (USMC)

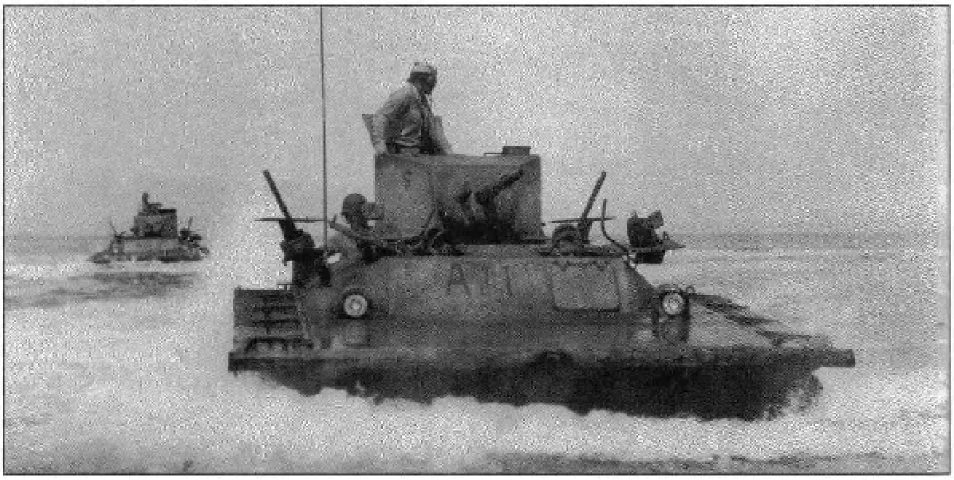


Marines inspect a knocked out LVT-1, number "49", named "MY DE LORIS". Losses of amtracs at Tarawa were extremely high, about 72%, but they proved essential in the costly Marine victory. (USMC)



While the Marines assaulted Betio atoll, the Army attacked more weakly defended Makin. A total of 48 LVT-2 amtracs reached the Army's 193rd Tank Battalion shortly before the 27th Infantry Division set sail from Hawaii, and a Provisional Company was organized to support the Makin landings. These are a pair of the Army's LVT-2s lost near the beach itself on 20 November 1943. (US Navy)

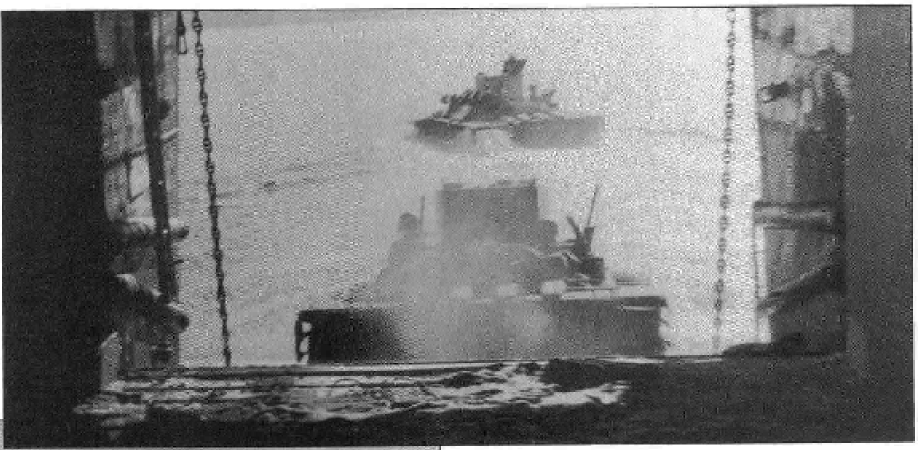
By the time of the attack on Kwajalein atoll in February 1944, the first of the new LVT(A)-1s had arrived. The Marines used these in the lead waves to provide fire support. These are a pair of LVT(A)-1s of the Marine 1st Amtrac Battalion during the fighting for the Marshalls. (USMC)

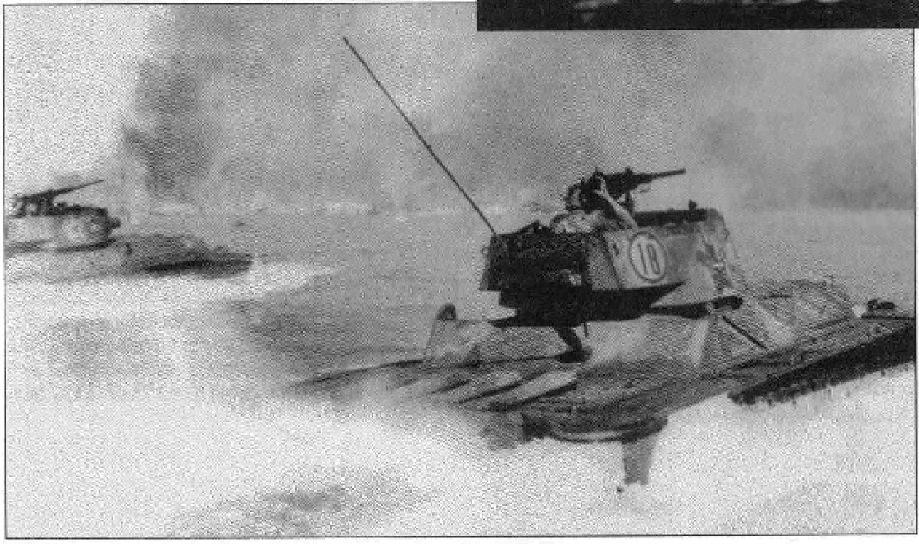


Marine's come ashore on one of the islands in the Kwajalein atoll in February 1944 with their LVT-2 in the background. The high sides of the LVT-2 were a continual problem for disembarking as seen here. (USMC)

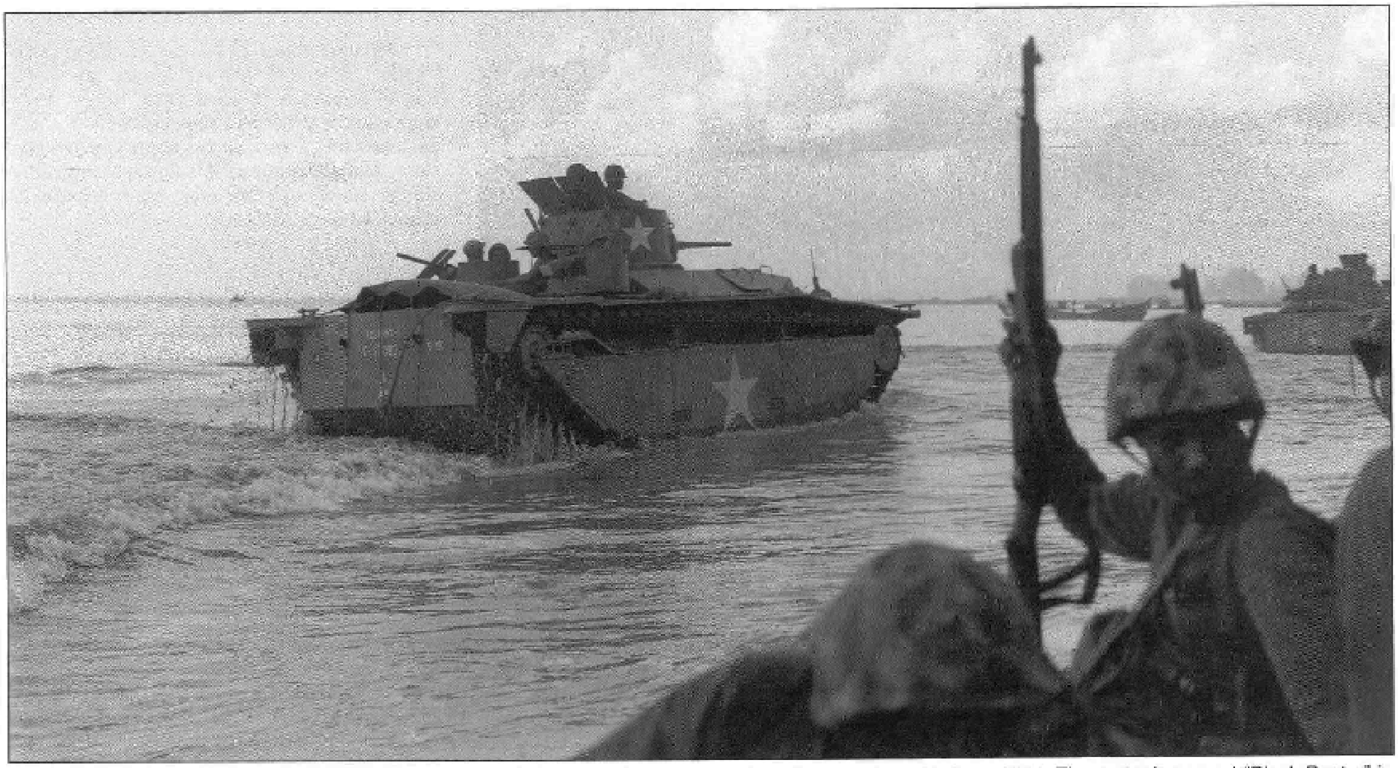
Senior Navy and Marine officers confer next to a disabled Marine LVT(A)-1 named Texas following the successful landings on Namur island in the Kwajalein atoll on 1 February 1944. This shows the tactical number "D-14" on the back of the turret, and the script "Texas" below. (USMC)

LVT(A)-1s disembark from the bow of a Navy LST during the landings on Saipan as part of Operation Forager. A total of 732 Army and Marine amtracs were used during the operation, and it saw the debut of the LVT(A)-4 and the LVT-4. (US Navy)

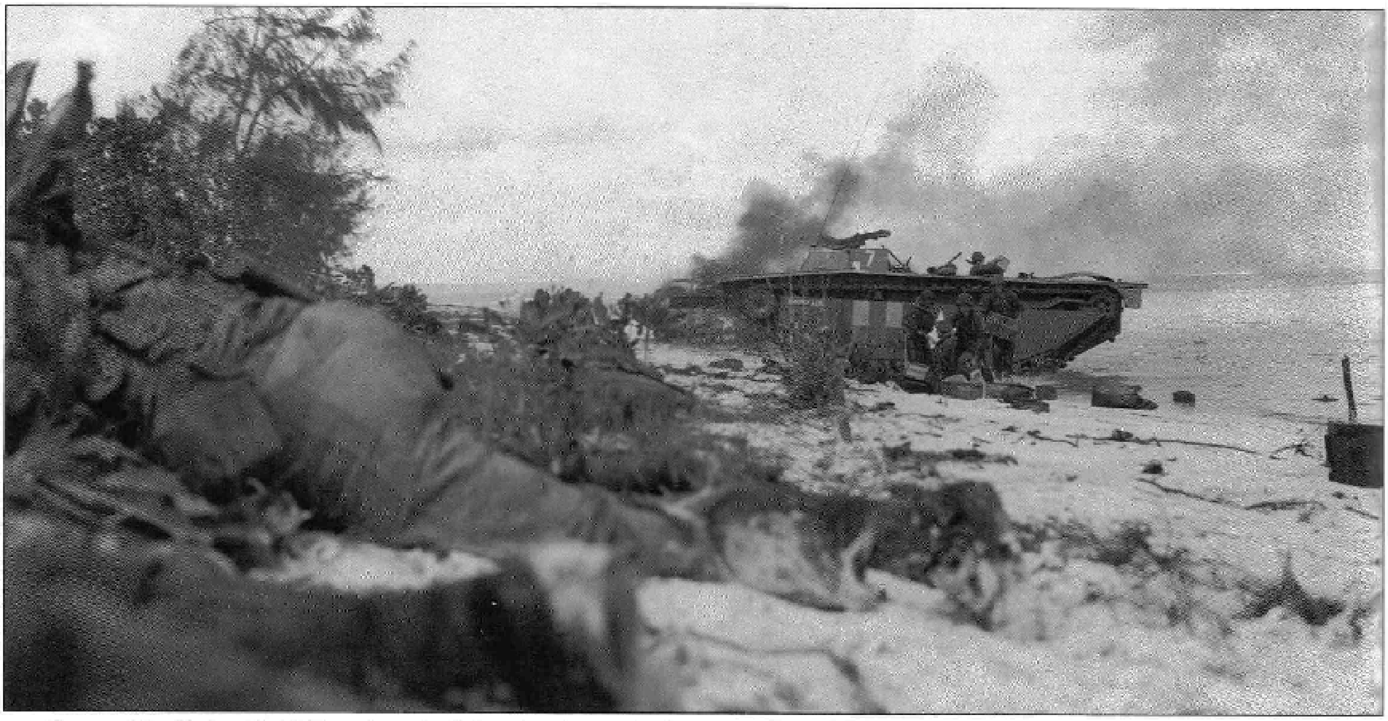




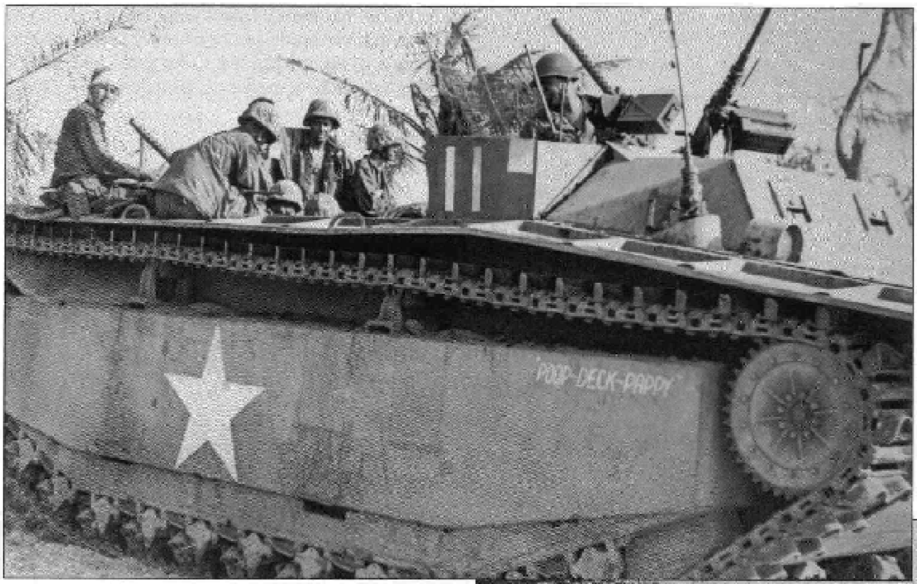
Marine LVT(A)-4 amtanks move ashore towards Saipan on 15 June 1944. This was the first time that the LVT(A)-4 were used in combat. Note that the Marine troops have painted out the Army's white star on the turret side, and added their own tactical markings, a circled 18. (USMC)



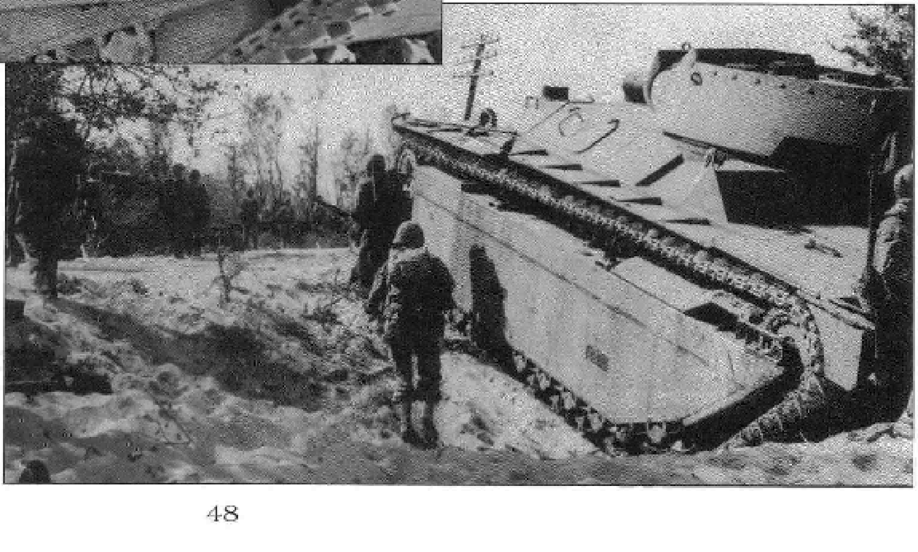
With Marine troops in the foreground, an Army LVT(A)-1 amtank passes by along the beach on 15 June 1944. The amtank, named "Block Buster" is from Company B of the Army's 708th Amphibious Tank Battalion which supported the Marine's 23rd Regiment Combat Team, 2nd Division. This was the first Army amphibious tank battalion to be raised in December 1943, and it saw extensive fighting at Saipan. The tactical markings on this vehicle, two vertical blue stripes for Blue Beach 2, are almost invisible since they blend in with the vehicle's normal camouflage color. Company A was assigned to Blue Beach 1. (USMC)



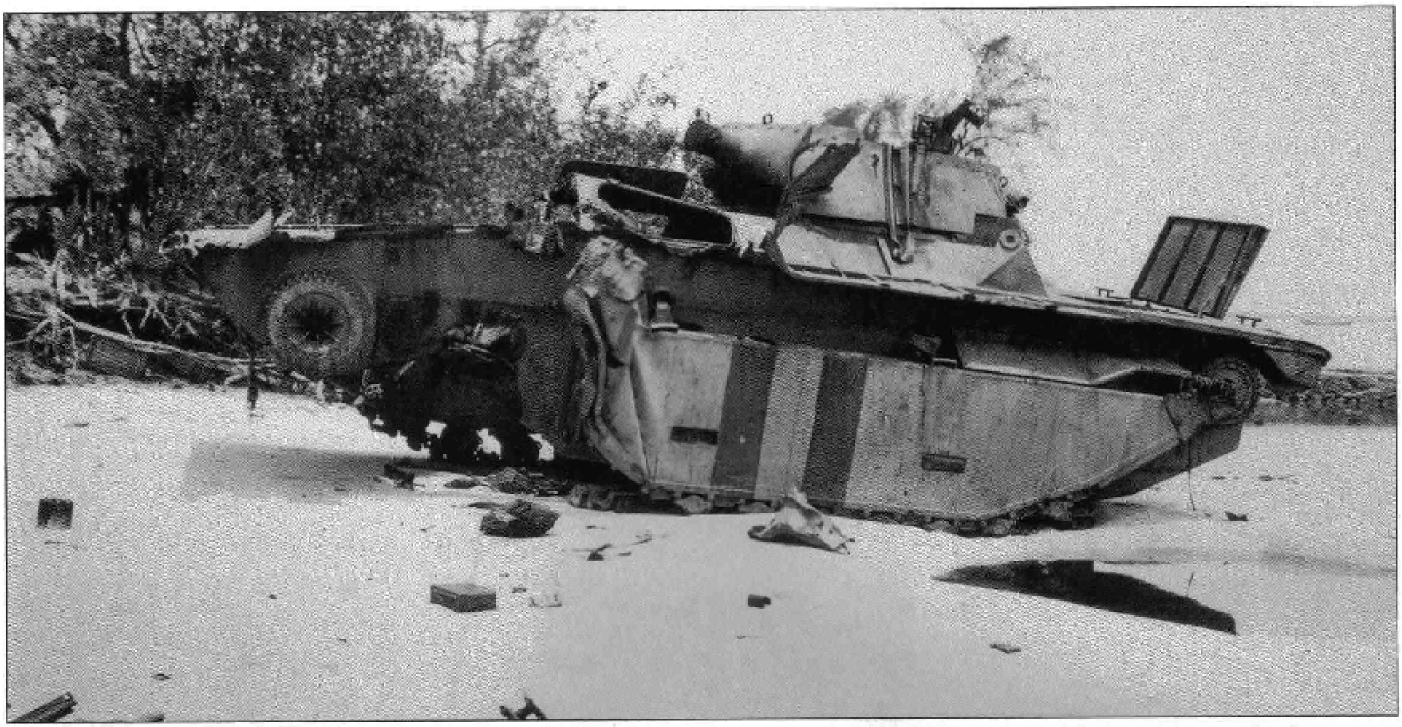
Troops of the Marine 4th Division along the Saipan beaches on 15 June 1944. The LVT(A)-2 in the background, named "Sandra Lee", is unloading supplies while another amtrac behind it is burning, one of twenty amtracs knocked out during the landing. The two vertical bars on the amtrac side are in the color of the beach to which the amtrac was assigned. There were four beach zones at Saipan, Red, and Green for the Marine 2nd Division and Blue and Yellow for the 4th Division. This is from Yellow 2, the southern-most of the landing beaches. From the markings, this is from one of the Army amphibious tank battalions that supported the Marines during the landings. (USMC)



An uparmored LVT-2 called "Poop-Deck-Pappy" transports Marine troops along the Saipan beach on 15 June 1944. Notice that a large plate of armor has been welded to the side pontoon, covering over the normal rectangular steps. Many unarmored LVT-2s were armored in Marine depots to make them more suitable for assault landings. (USMC)

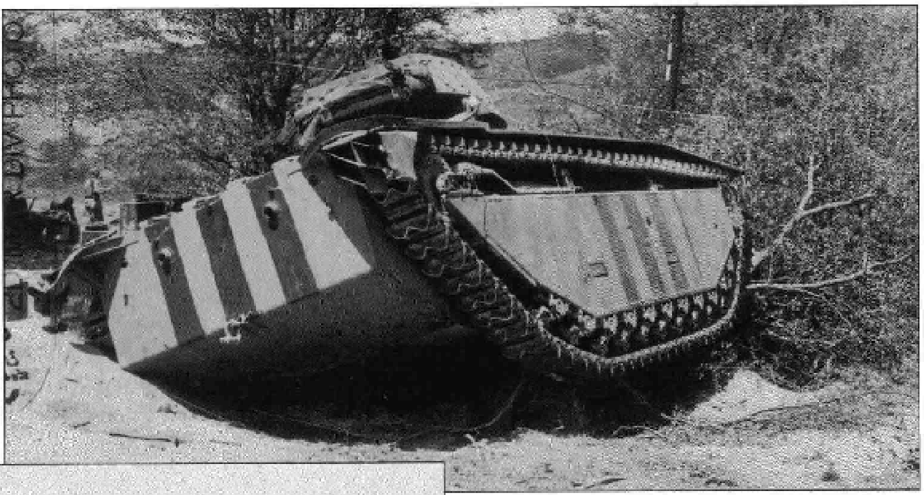


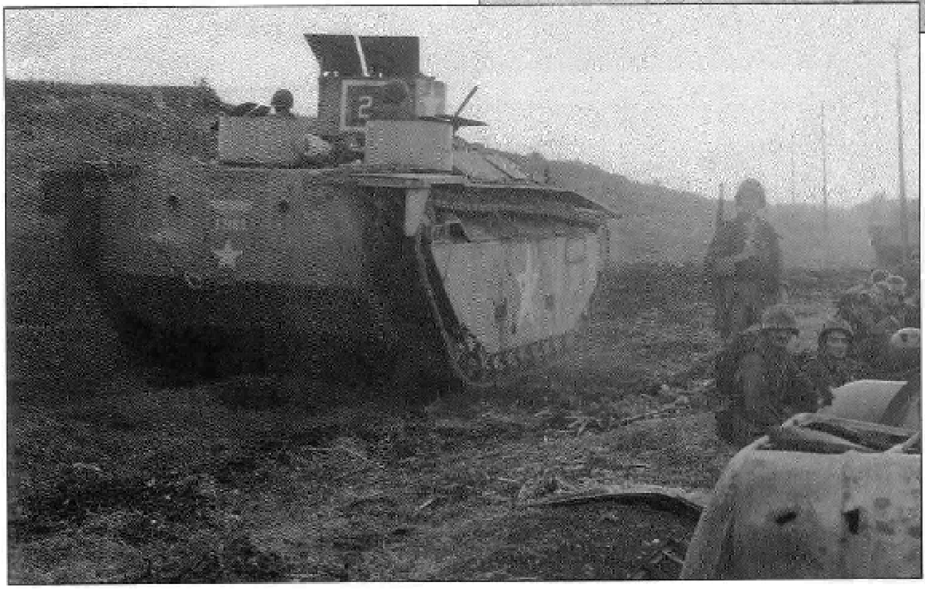
Marine troops advance past a disabled LVT(A)-4 at Red Beach 1, the northern-most landing beach, on Saipan on 15 June 1944. The early LVT(A)-4s lacked machine gun positions, which were quickly added for later campaigns due to the need to combat Japanese infantry. (USMC)



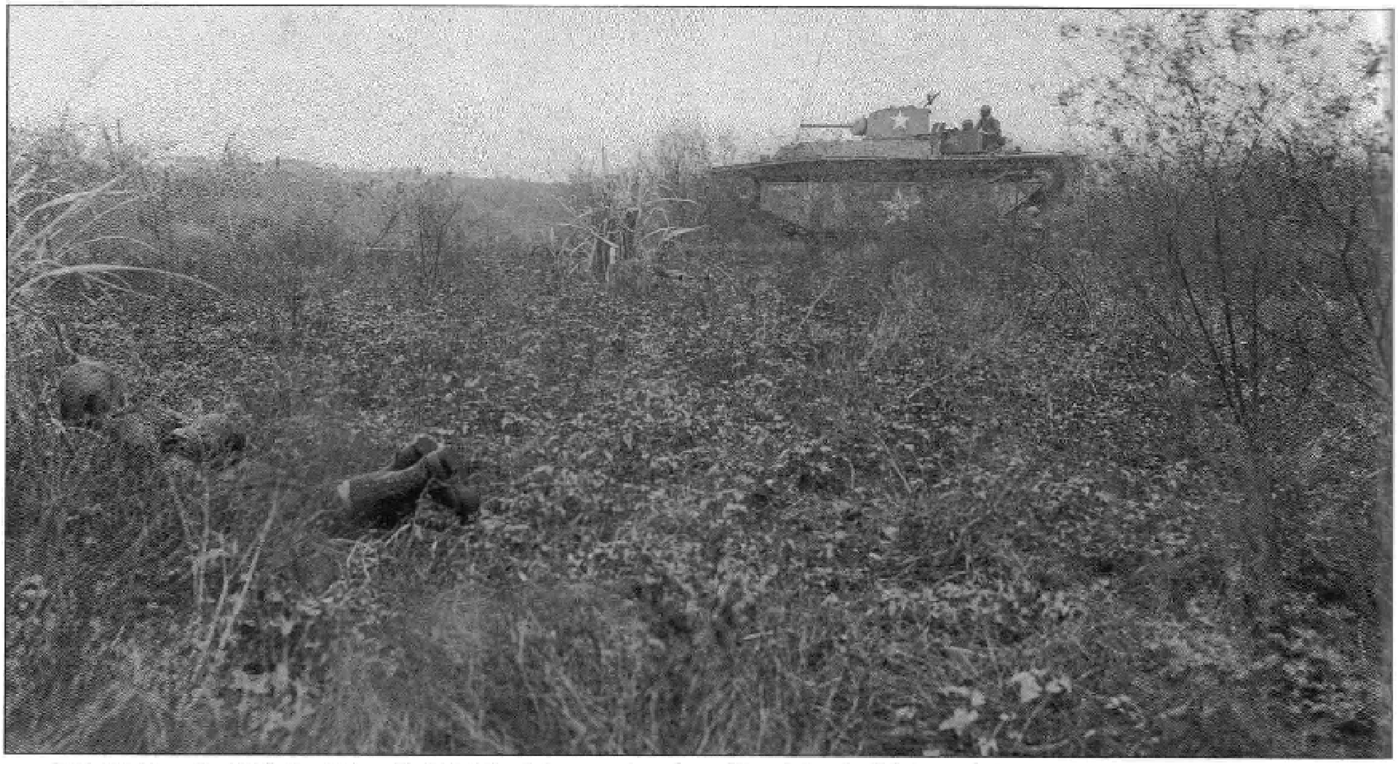
A knocked out Marine LVT(A)-4 on Saipan of the 2nd Armored Amphibian Battalion at Red Beach 2 on 15 June 1945. It would appear that the pontoon was shattered by an artillery round, as there is no evidence of a mine crater near the vehicle. Note that the open engine deck grating it's the louvered type, not the type with the four rectangular mushroom covers. The two vertical red stripes indicate the beach, Red Beach 2, which was attacked by the Marine's 2nd Division. (USMC)

Another knocked out LVT(A)-4 of the 2nd Marine Armored Amphibian Battalion near Red Beach 3. The terrain on Saipan permitted the amtanks to follow the troops inland, where they provided valuable fire support. (USMC)



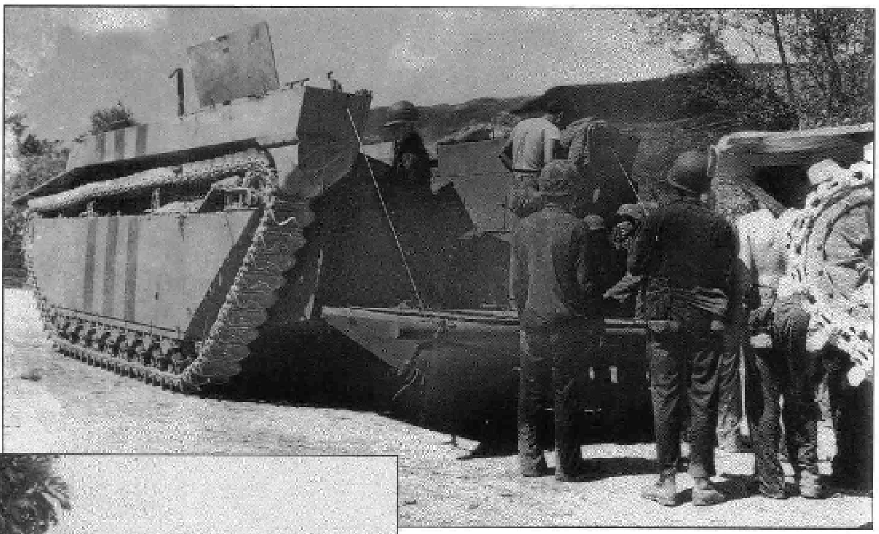


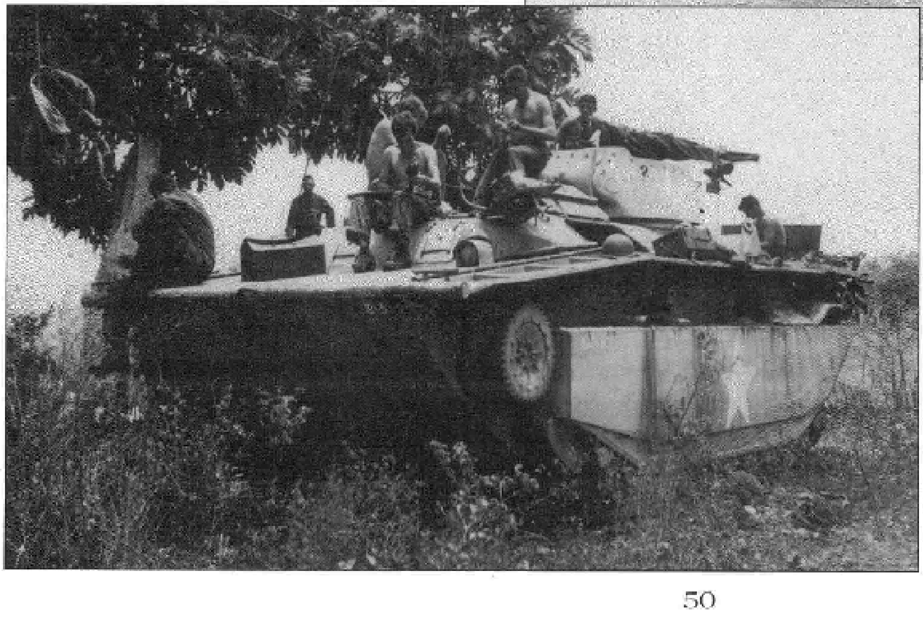
LVT(A)-1 amtanks of the Army's Company A, 708th Amphibious Tank Battalion move past a group of Marines of the 4th Division during the attacks beyond Hill 500 on 22 June 1944. Notice that by this stage of the war, the armored collars around the rear scarf ring machine gun positions have been heightened to provide the gunners with better protection. (USMC)



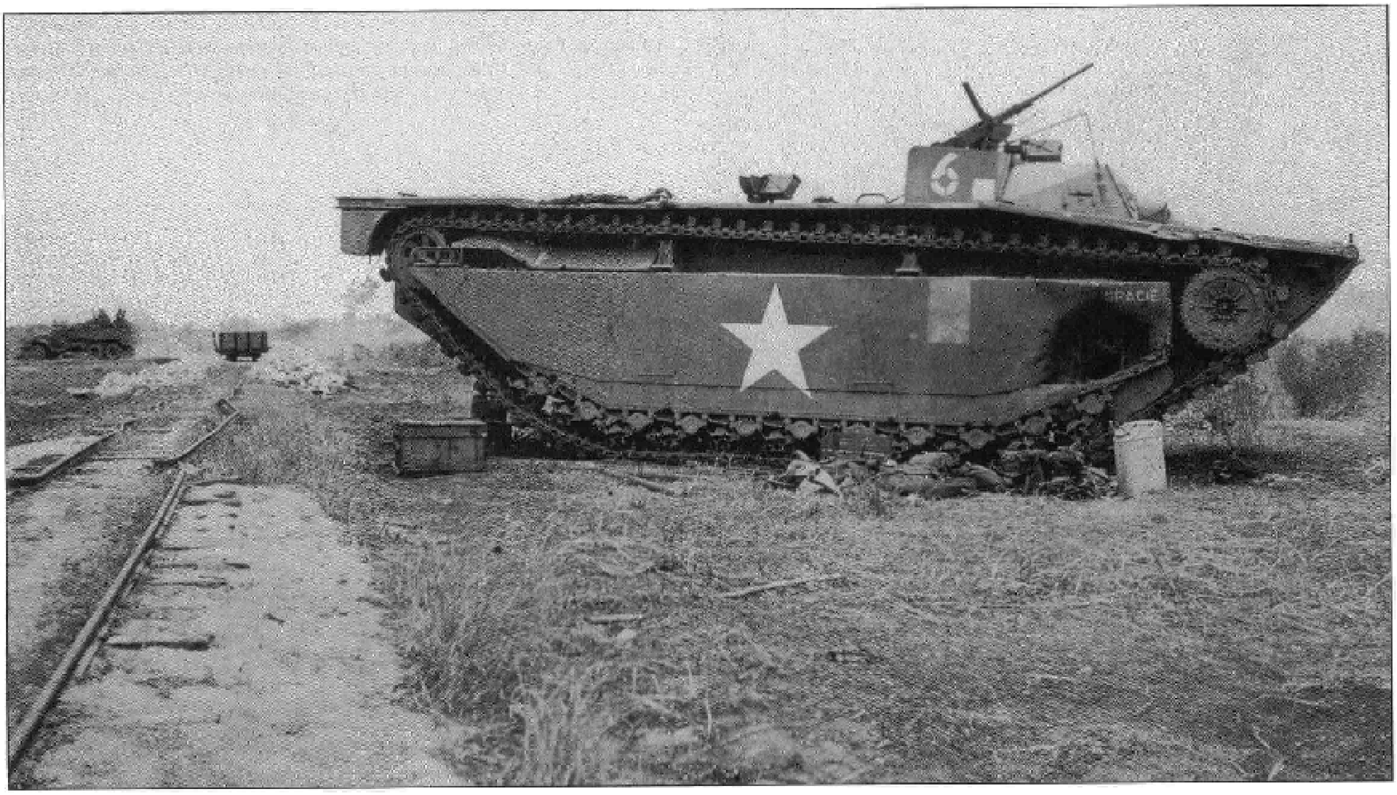
A LVT(A)-1 from the 708th Amphibious Tank Battalion takes on a Japanese pillbox during the fighting on Saipan on 17 June 1944. Although the amtanks were widely used after the initial beach landings, they were very weakly armored compared to normal tanks, and very vulnerable to any type of Japanese anti-tank weapon. (US Army)

Saipan was the operational debut of the LVT-4 which had a more accessible cargo bay. This is an amtrac supporting the Marine 2nd Division on Red Beach 3 in June 1944. (USMC)

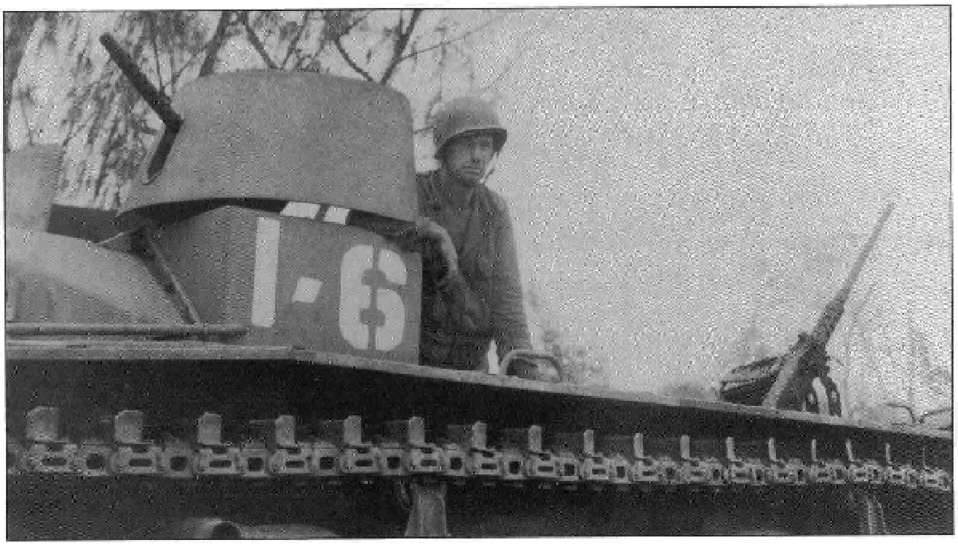




This is an Army LVT(A)-4 of Company B, 708th Amphibious Tank Battalion, named "Bad-Boys", on Saipan in June 1944. Most of the battalion had the earlier LVT(A)-1, but a total of 16 of the new LVT(A)-4 arrived shortly before the unit disembarked for the landings. Company B landed at Blue Beach 2, but the tactical beach landings are almost invisible due to their similarity in color to the vehicle's Ocean Gray camouflage. (USMC)

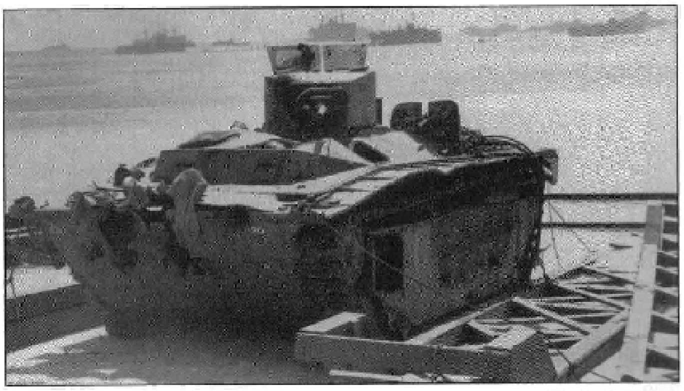


An Army uparmored LVT-2 on Saipan, probably Yellow Beach 1. The amtrac has been hit by an artillery round on the front of the pontoon, creating a large hole under the vehicle name "Gracie". (USMC)

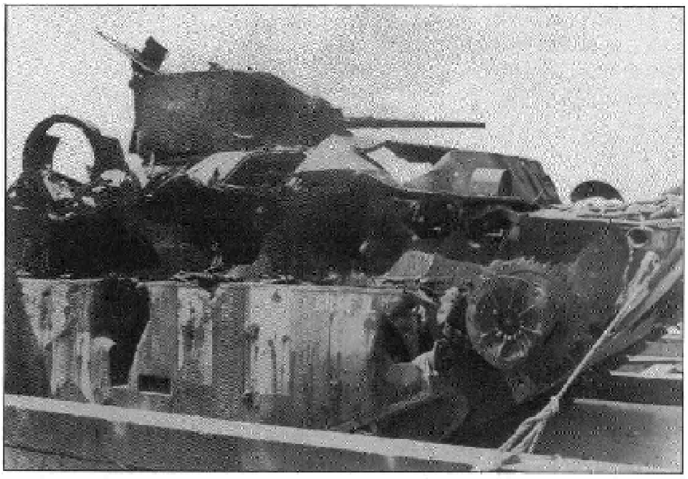


A close-up of the modifications undertaken on many Army and Marine amtracs before Saipan. An armored extension was added behind the normal driver's compartment, and a pintle mounted .30 cal machine gun with an improvised shield was added for more firepower. (USMC)

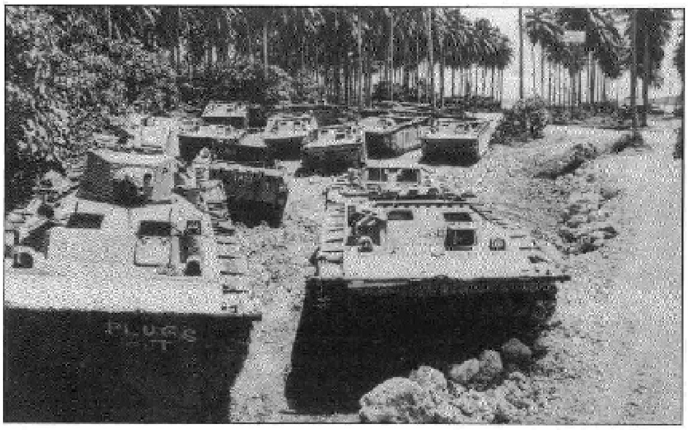
A column of Army LVT-2 amtracs move forward on Saipan on 24 June 1944. They appear to carry markings from Red Beach 1. (US Navy)



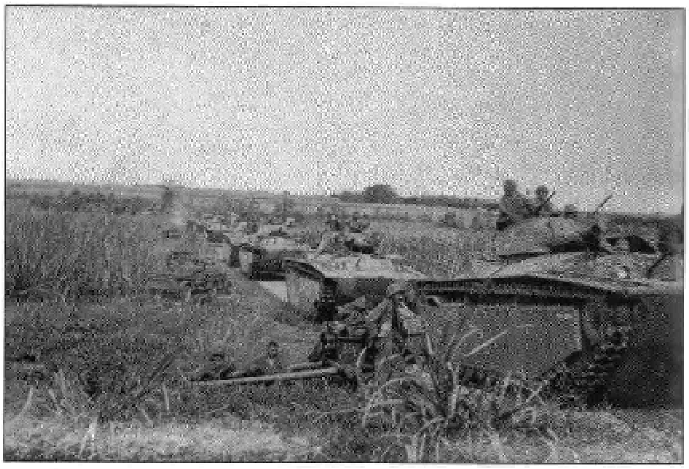
One of the LVT(A)-1s of the Army's 708th Amphibious Tank Battalion knocked out on Saipan. The battalion started the battle with 68 amtanks, and lost 16 totally destroyed like this one plus a further 14 disabled but repairable. (US Navy)



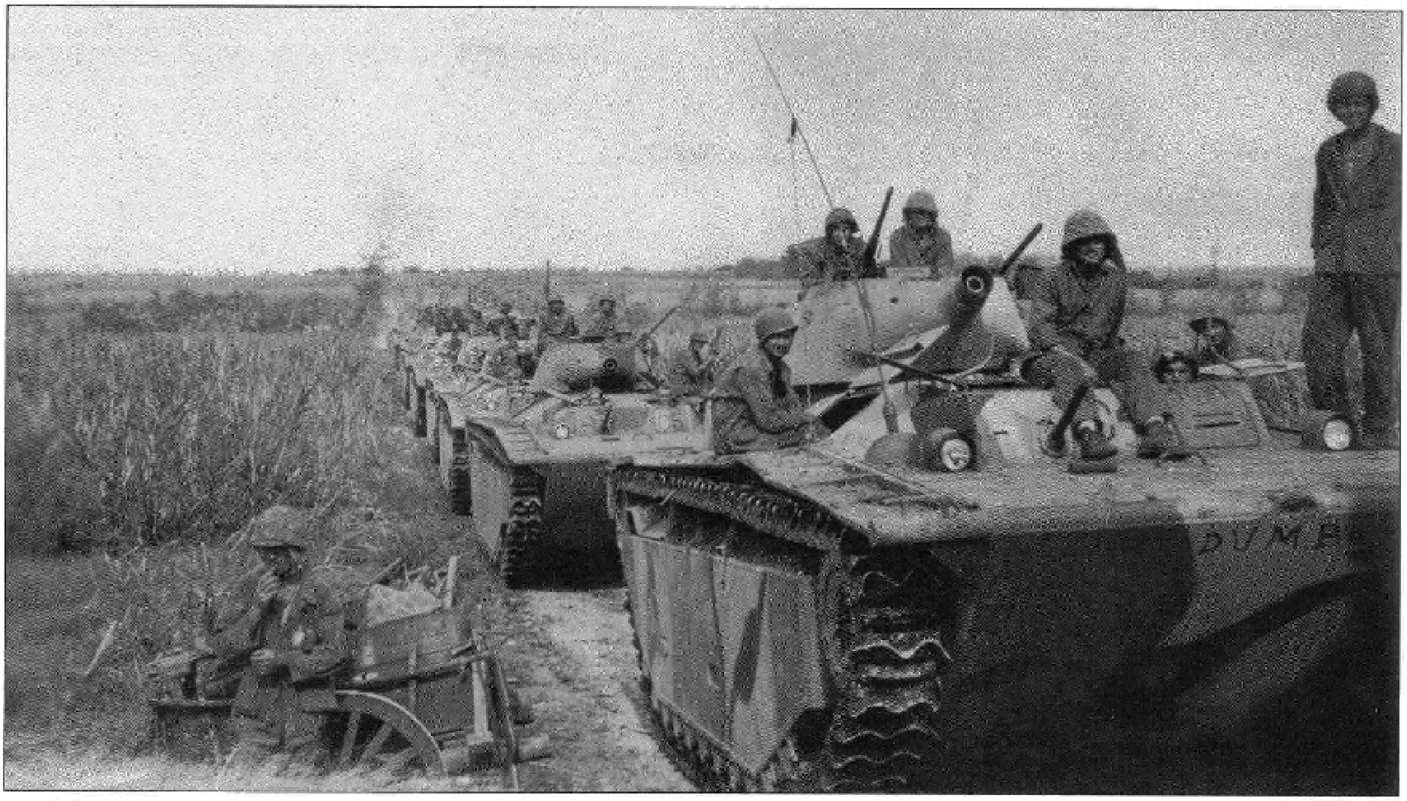
Another view of the same vehicle, "C-20 Crazy Legs", of Company C. This particular vehicle has been hit numerous times by artillery fire. This was one of 17 LVT(A)-1s that landed with the first wave on Yellow Beach 2, and so the beach markings on the side are two yellow vertical bars. (US Navy)



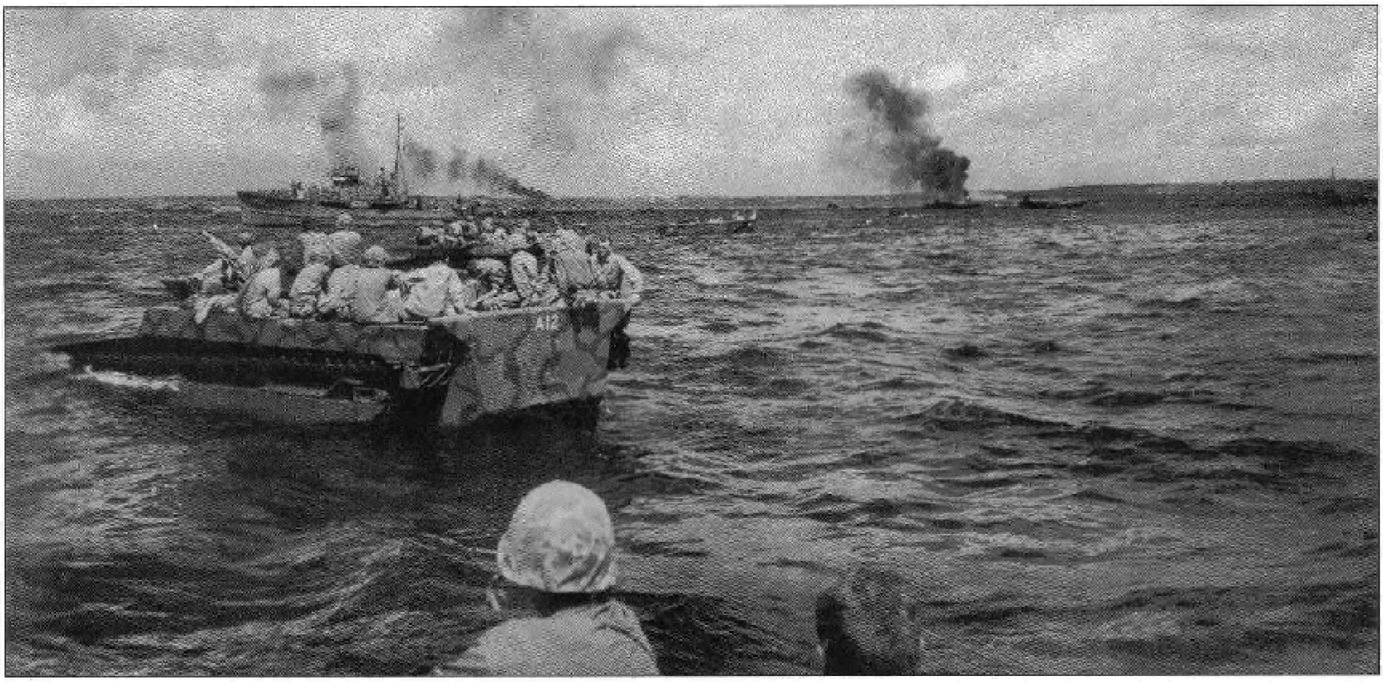
A Marine depot following the Marianas operation shows a variety of amtrac types including a LVT(A)-1 and several of the new LVT(A)-2. (USMC)



The next target in the Marianas was Guam, which was assaulted on 21 July 1944. The fighting on Saipan had revealed that the blue camouflage scheme on the amtanks, while useful when in the water, was not a good idea once the amtanks were fighting on land. As a result, Marine amtanks like the LVT(A)-4s seen here, were given a hasty camouflage painting before the operation. This column was moving inland on 28 July 1944 (USMC)

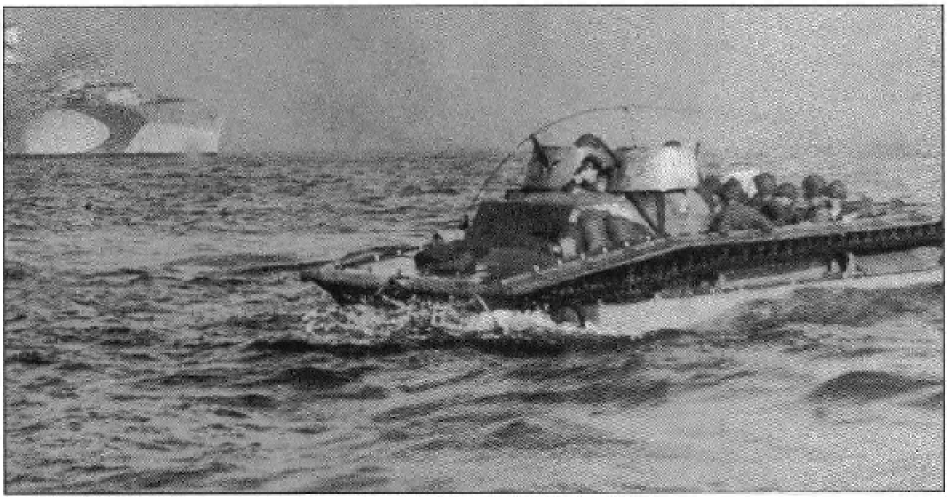


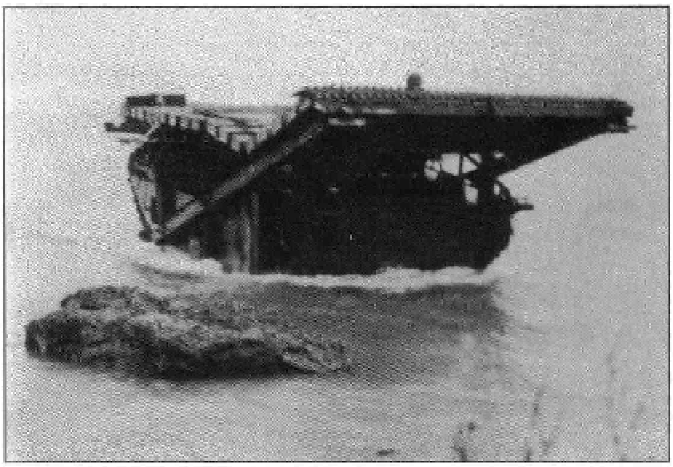
A close-up of one of the vehicles in the convoy, amtank number "C-4", shows the name "Dumbo" on the bow after the popular Disney cartoon character. Note that by this time, the amtanks are armed with an additional bow mounted .30 cal machine gun. However, following the Marianas campaign, it was the general opinion that the LVT(A)-4 needed more protected machine guns. (USMC)



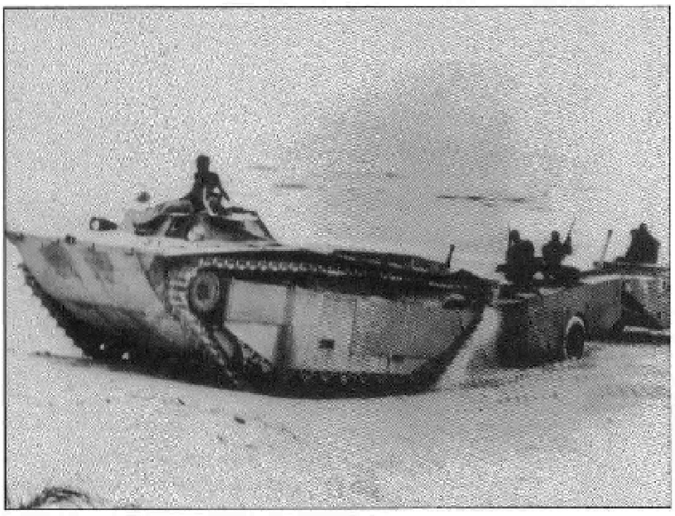
The third assault in the Marianas was against Tinian on 24 July 1944. The amtracs are forming up off-shore before the attack. This amtrac is one of the new LVT-4s and has pattern painted camouflage. (USMC)

The assault waves go in at Tinian as a cruiser in the background provides covering fire. This is an uparmored LVT-2 with the added side armor panels and twin .30 cal machine guns. (US Navy)

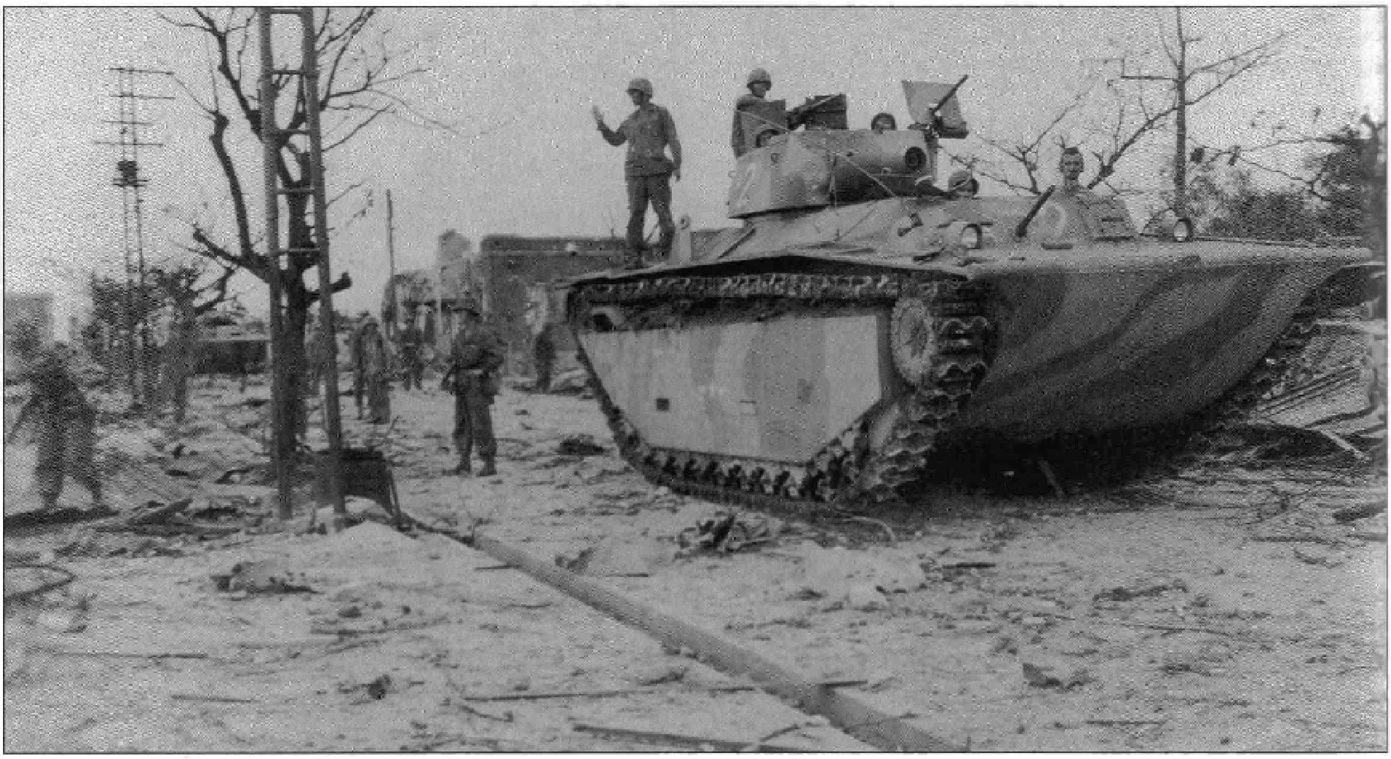




One of the innovations at Tinian was the use of "Doodlebugs". These were amtracs modified with a timber ramp. They were intended to beach against high sea walls, allowing subsequent waves of amtracs to crawl over them and over the walls. Twelve of these were built, and they proved successful. (USMC)

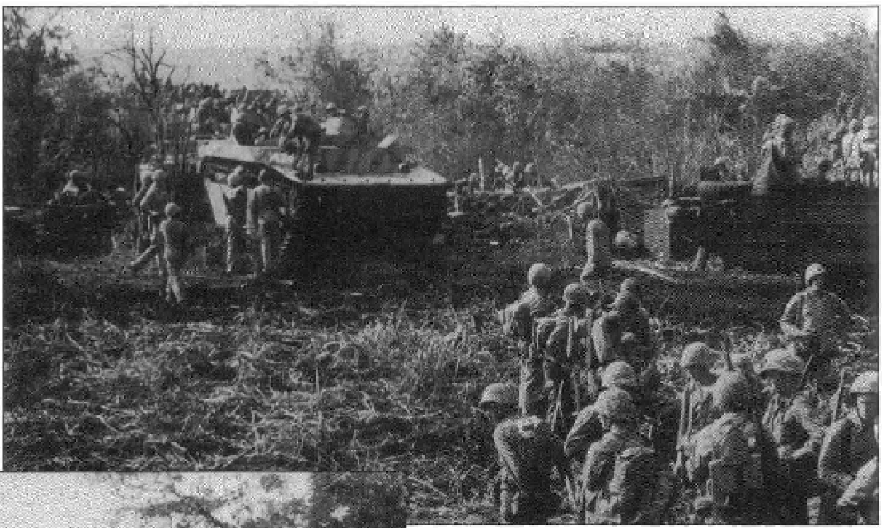


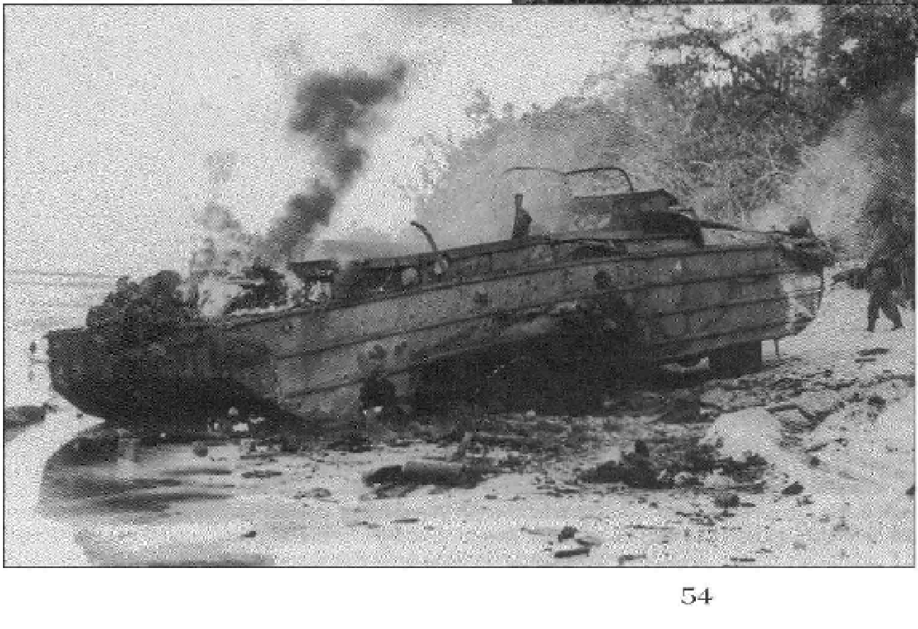
Another innovation used in the Pacific was the amphibious trailer. These could be towed behind the amtracs, carrying additional supplies. They do not appear to have been commonly used. (Patton Museum)



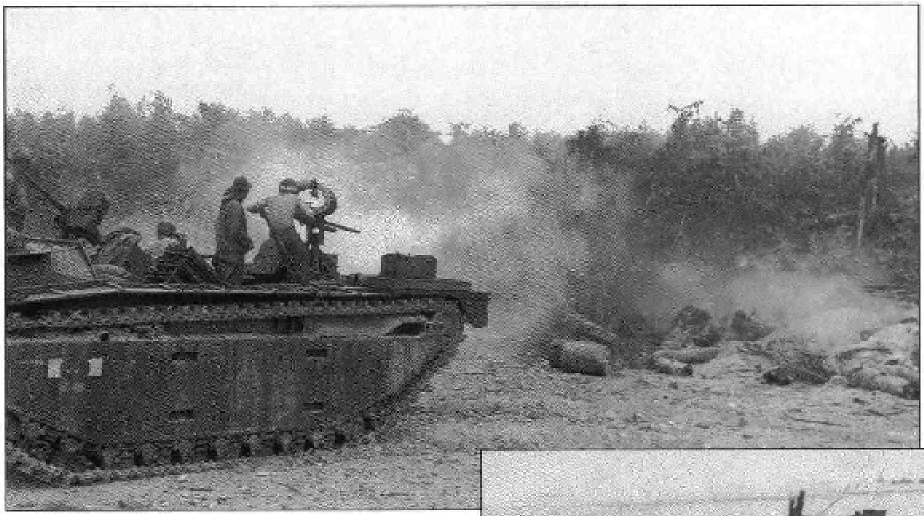
A Marine LVT(A)-4 of the 2nd Armored Amphibian Battalion on Tinian in August 1944. The two turret machine guns have had improvised armored shields added. In addition, the vehicle has pattern painted camouflage. (USMC)

A Marine column moves in from the beach on 2 August 1944. To the left is a LVT-4 with improvised armor on the front, and to the right are a pair of DUKWs. (USMC)



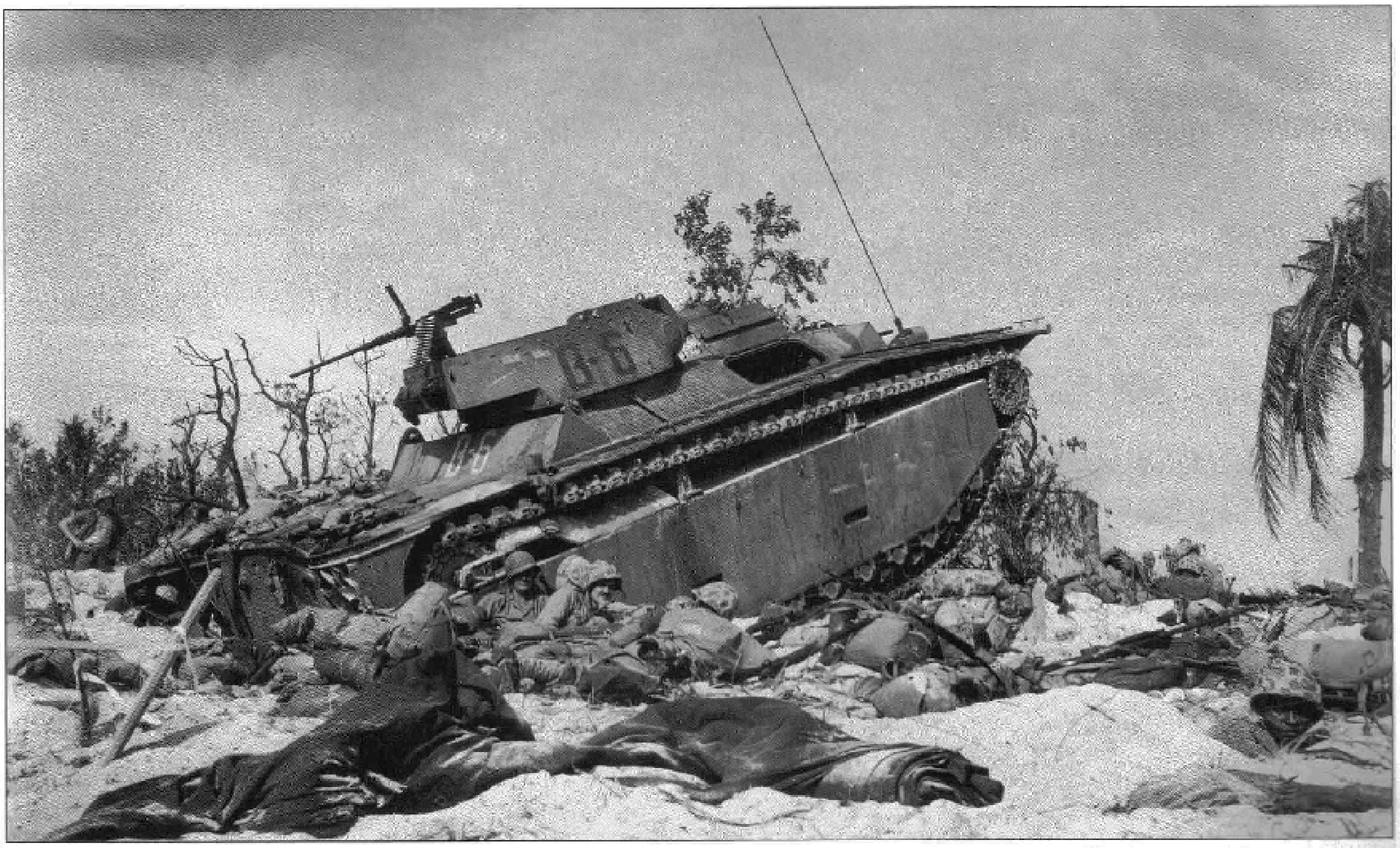


Although the DUKW was not as central to amphibious operations in the Pacific as it was in Europe, they still saw widespread use. This DUKW has been knocked out by mortar fire during fighting on Noemfoor Island in New Guinea on 17 August 1944. (USMC)

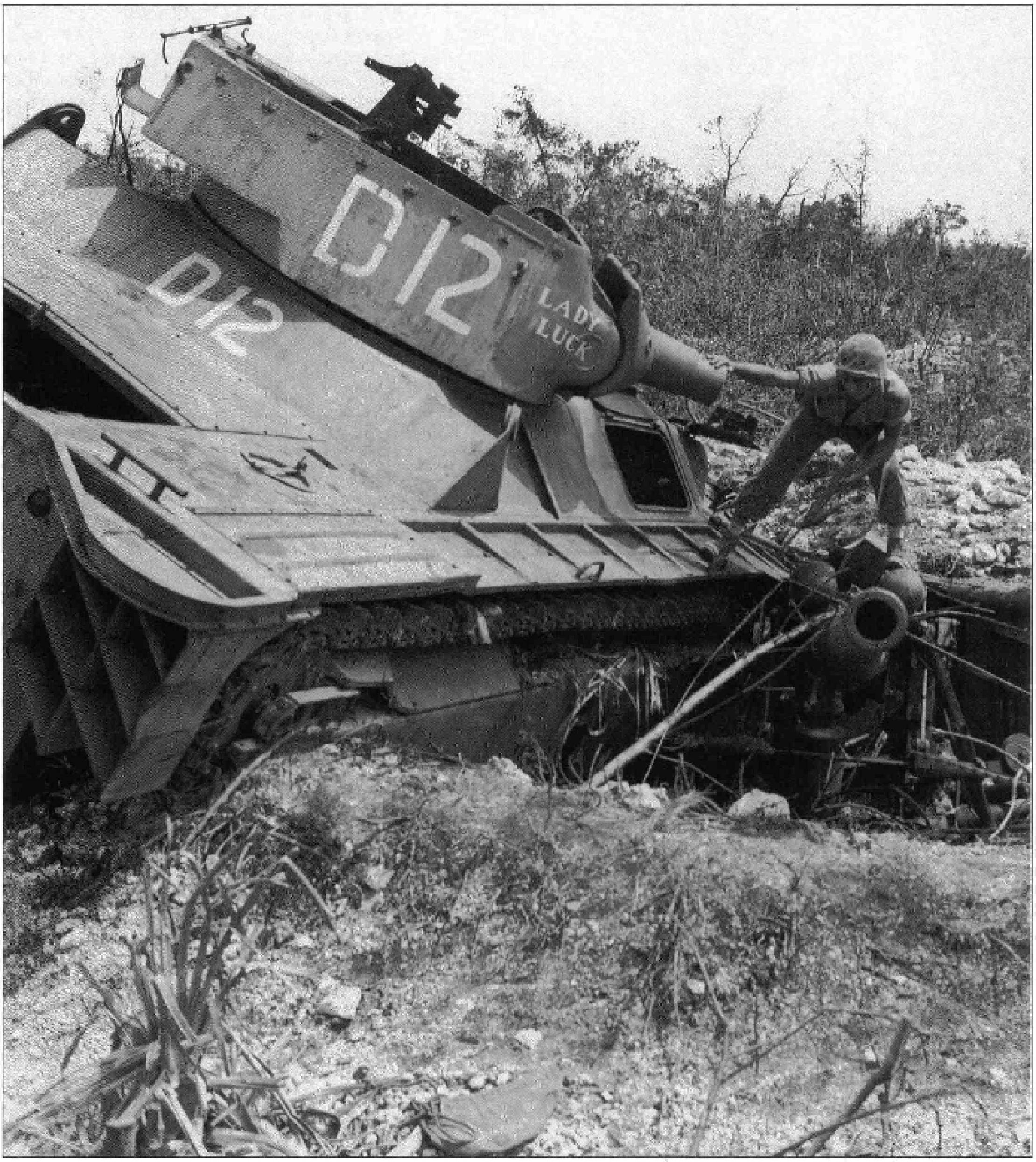


The Army's 2nd Engineer Special Brigade Support Battery modified a number of LVT(A)-2 amtracs to provide fire support. On the stern is a 37mm automatic cannon taken from a P-39 fighter aircraft and mounted on an improvised pintle. In the cargo bay are the rails for a barrage rocket launcher. This vehicle is being used to attack Japanese dug-outs on Schouten Island in the Dutch East Indies in 1944. The cartoon on the hull side shows a snorting bull. (US Army)

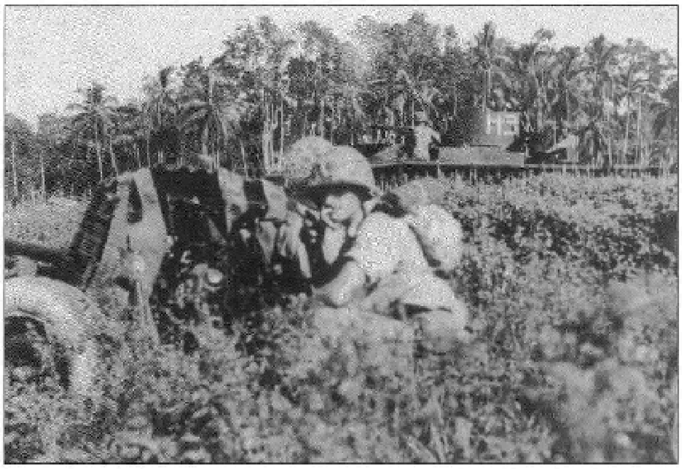
Following the Marianas campaign, the Marines' attention turned to the Palaus, with an attack on Peleliu in September 1944. Peleliu was another fierce battle approaching the cost and intensity of Tarawa. This is a view from the water's edge as M4A2 medium tanks and amtracs move into the landing area on 15 September 1944. (USMC)



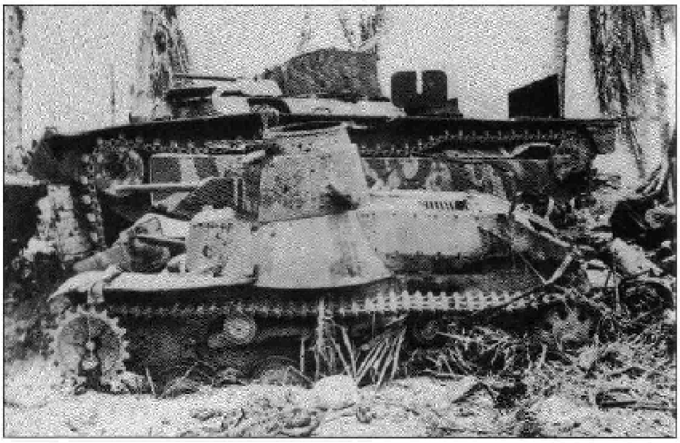
Marines use a disabled LVT(A)-4 of the 3rd Armored Amphibian Battalion for cover on Peleliu on 15 September 1944. The Japanese defenses on Peleliu included four concrete bunkers with 20mm and 47mm cannon that took a heavy toll of the thinly armored amtanks. The Marines instead depended on M4A2 medium tanks for close fire support. Note that the white tactical number on the turret side, "B-6", has been painted over to reduce its visibility. The practice of marking the amtracs with beach landing stripes was not common on Peleliu. (USMC)



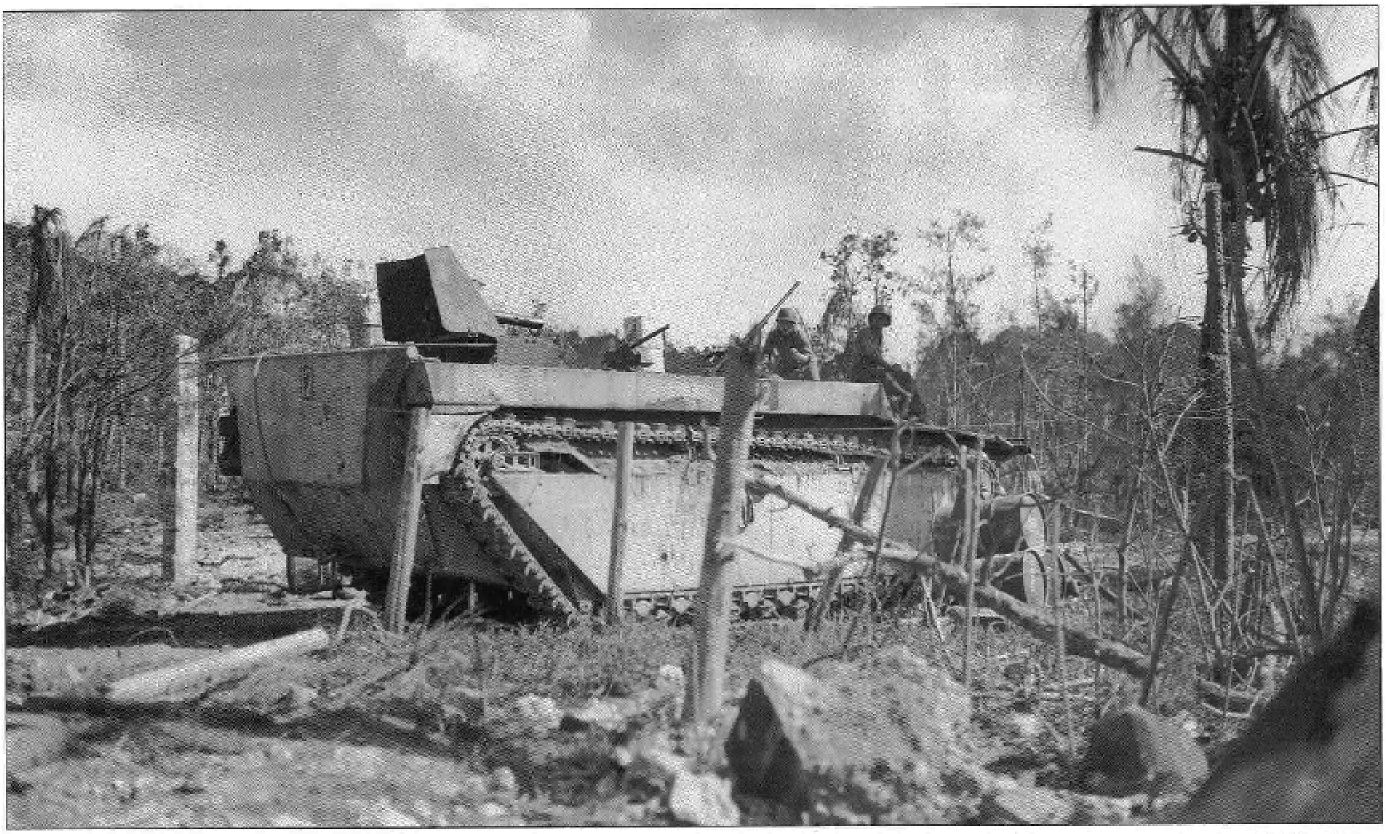
Close fire support sometimes meant very close. This LVT(A)-4 of the 3rd Armored Amphibian Battalion, "D-12 Lady Luck", charged a Japanese naval gun emplacement and put it out of action by crashing into the emplacement. As is evident in this view, the early LVT(A)-4 amtanks had a turret essentially similar to that on the M8 75mm howitzer motor carriage, complete with the ring mount for the .50 cal machine gun. (USMC)



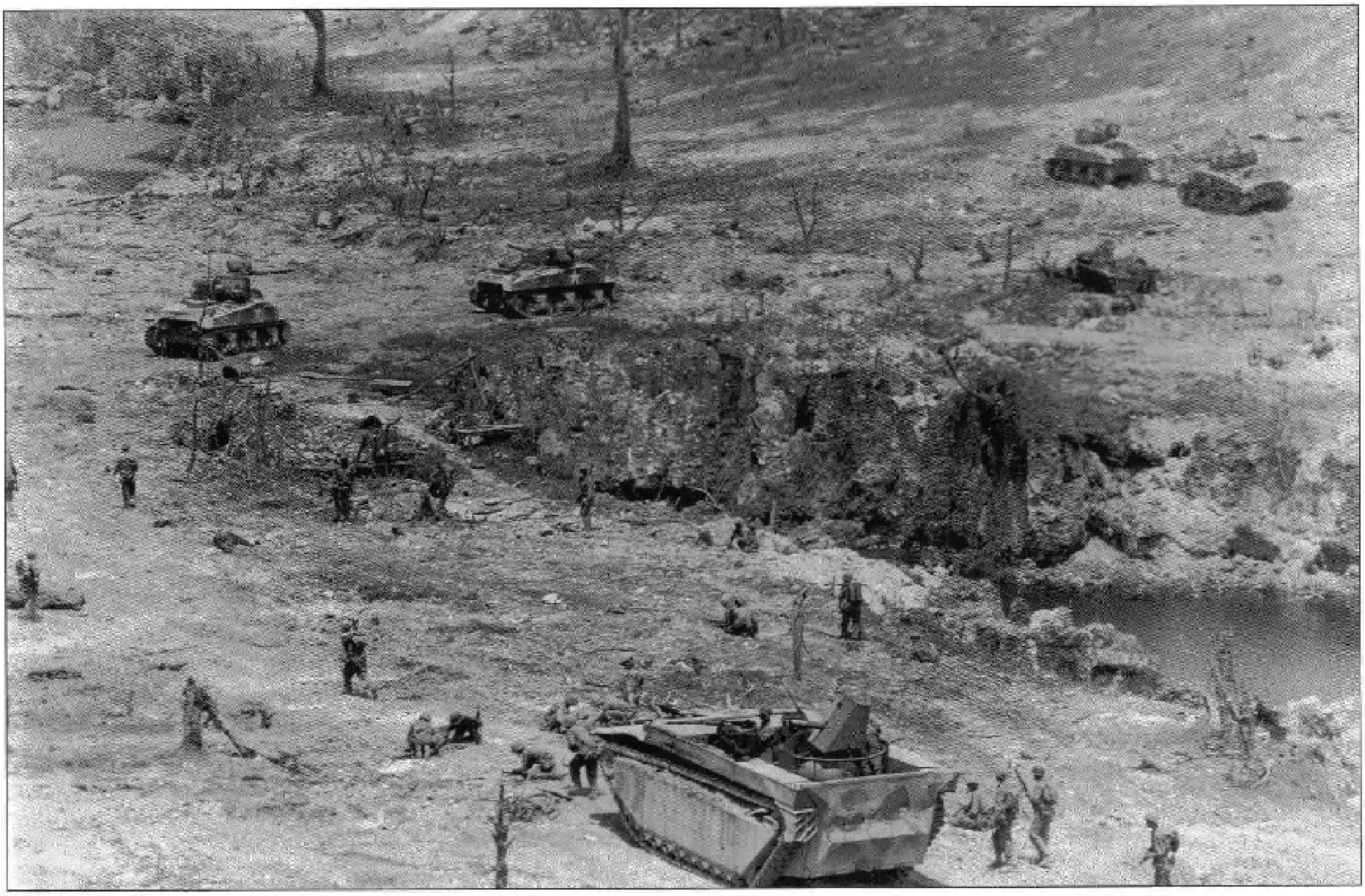
Although it was quickly being replaced by the LVT(A)-4, the older LVT(A)-1 was still in service with Marine amtank units in late 1944, as is evident from this view of a LVT(A)-1 of the 3rd Armored Amphibian Battalion during the fighting on Peleliu in September 1944. In the foreground is a Marine 37mm anti-tank gun.



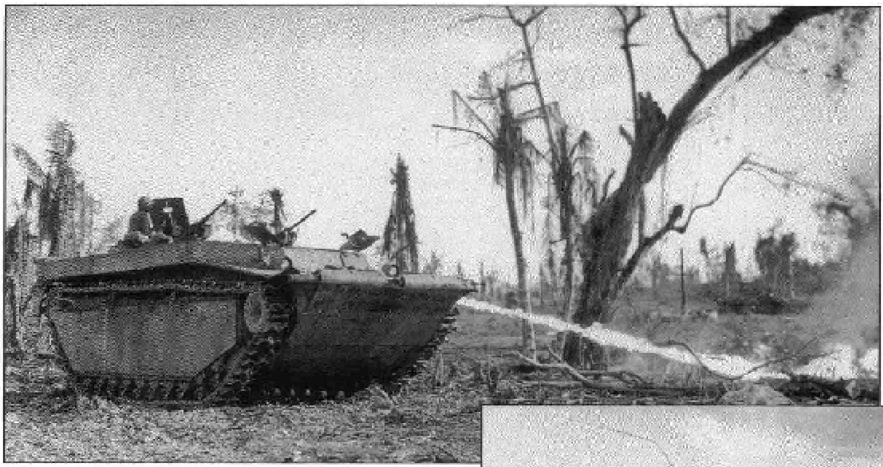
A disabled Japanese Type 95 Ha-go light tank of the divisional tank company of the 14th Infantry Division sits alongside a Marine LVT(A)-1 amtank near Peleliu airfield in September 1944. The attack by this tank company during the Peleliu battle culminated in the complete destruction of the unit, along with the loss of many Japanese infantrymen riding on the light tanks.



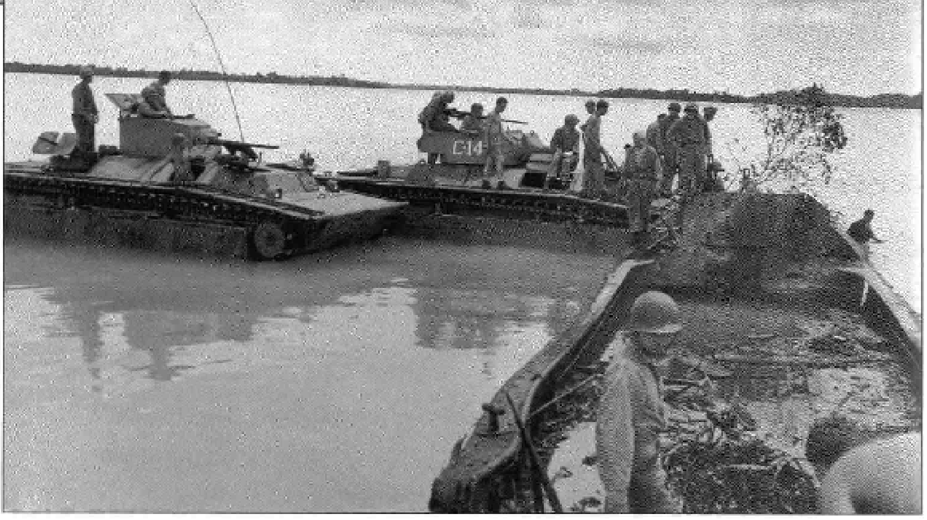
The extensive use of fortified bunkers by the Japanese in previous campaigns led the Marines to try improvised flame-thrower amtracs on Peleliu. These were built on a LVT-4 chassis, and the flame-gun was protected behind an armored shield. (USMC)



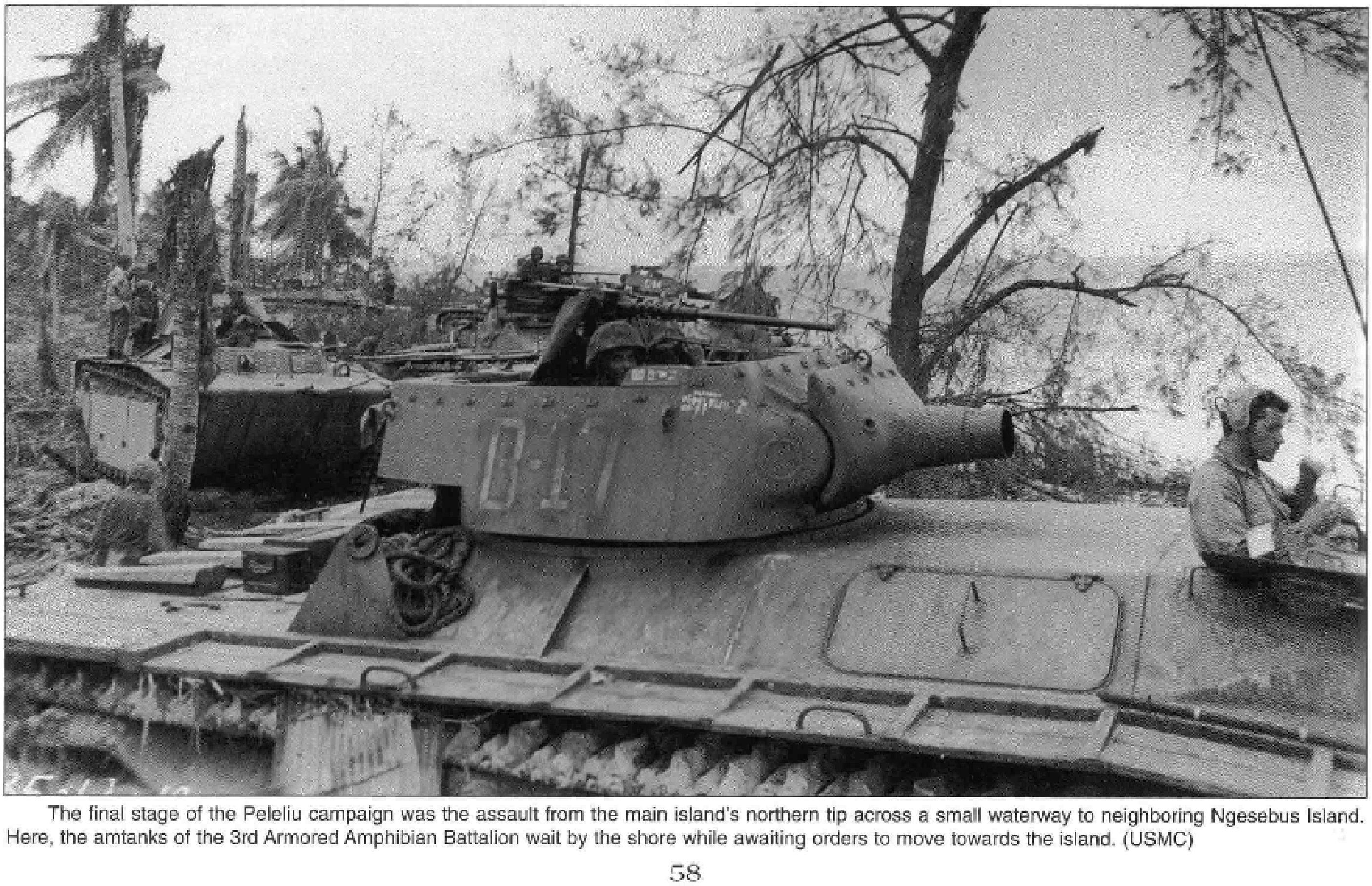
An armored assault on Peleliu halts while Marines remove a massive 200 pound land mine found in the path of one of the LVT-4 flame-thrower amtracs. In the background are M4A2 tanks from the Marine 1st Tank Battalion. (USMC)



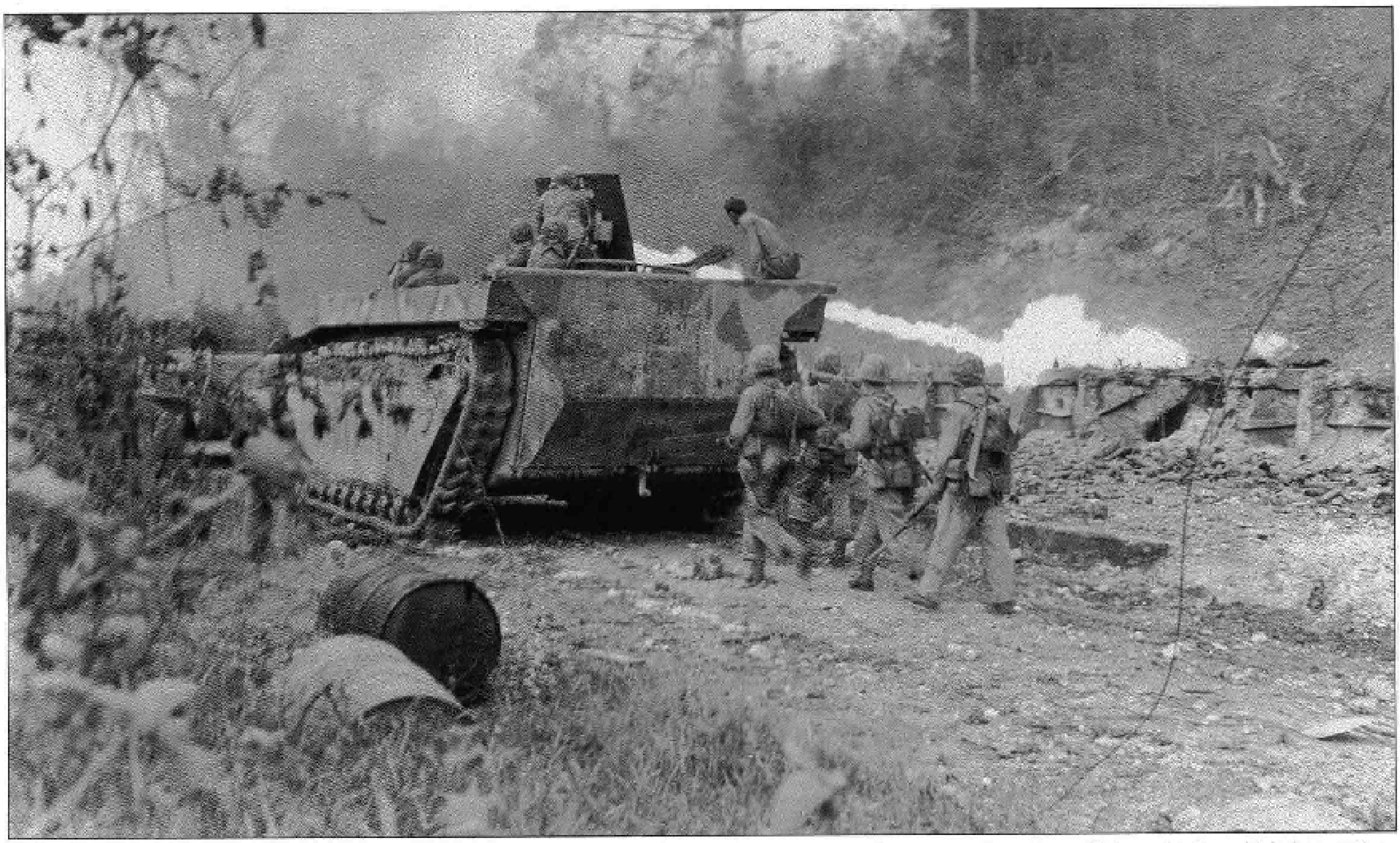
The armored amtrac flame-thrower in action on Peleliu. Japanese reinforced bunkers were well designed and difficult to knock out, even with the 75mm guns on the M4A2 medium tanks. (USMC)



The amtanks sometimes engaged in naval warfare during the island fighting. These two amtanks, a LVT(A)-1 on the left and a LVT(A)-4 on the right, were sent out to deal with a Japanese landing craft, which they shot up and captured. (USMC)

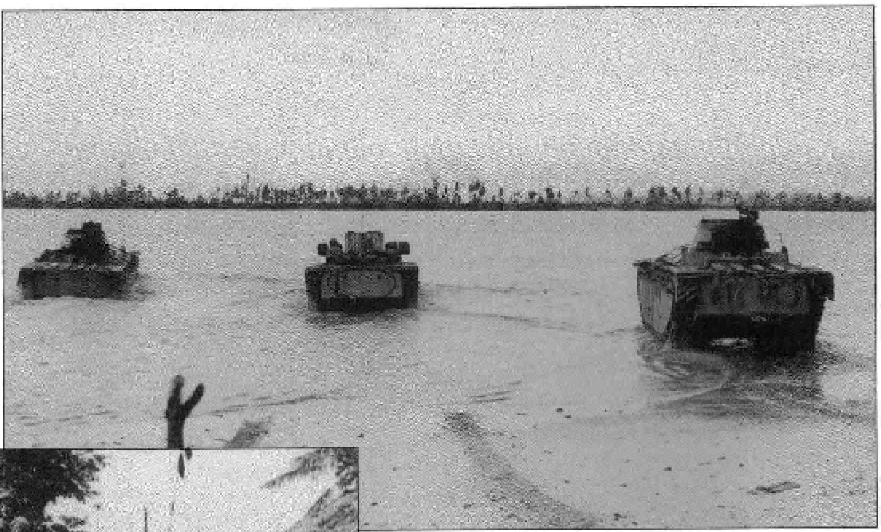


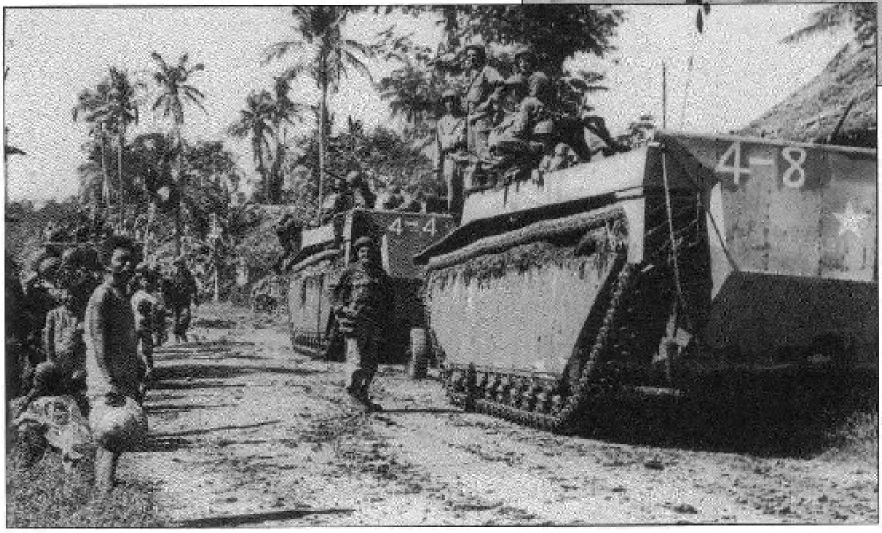
The final stage of the Peleliu campaign was the assault from the main island's northern tip across a small waterway to neighboring Ngesebus Island. Here, the amtanks of the 3rd Armored Amphibian Battalion wait by the shore while awaiting orders to move towards the island. (USMC)



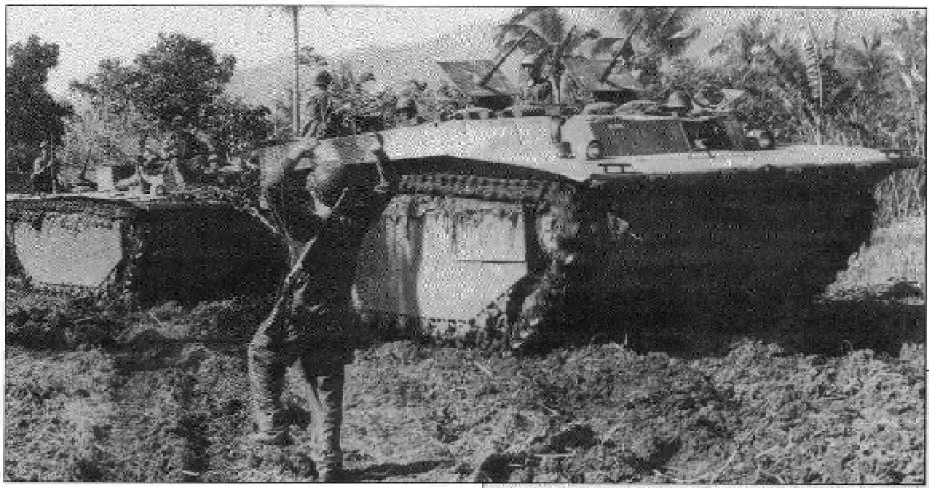
One of the armored amtrac flame-throwers was sent over to Ngesebus to attack Japanese bunker positions there. This particular vehicle has pattern painted camouflage.

The attack on Ngesebus Island begins as a trio of amtanks including a LVT(A)-1 numbered "B-8" moves across the waterway. (USMC)

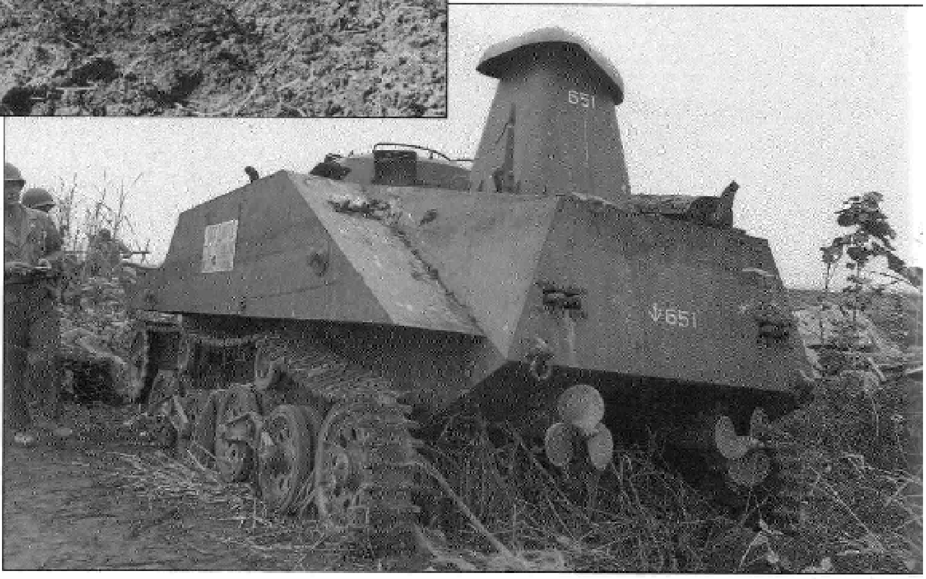




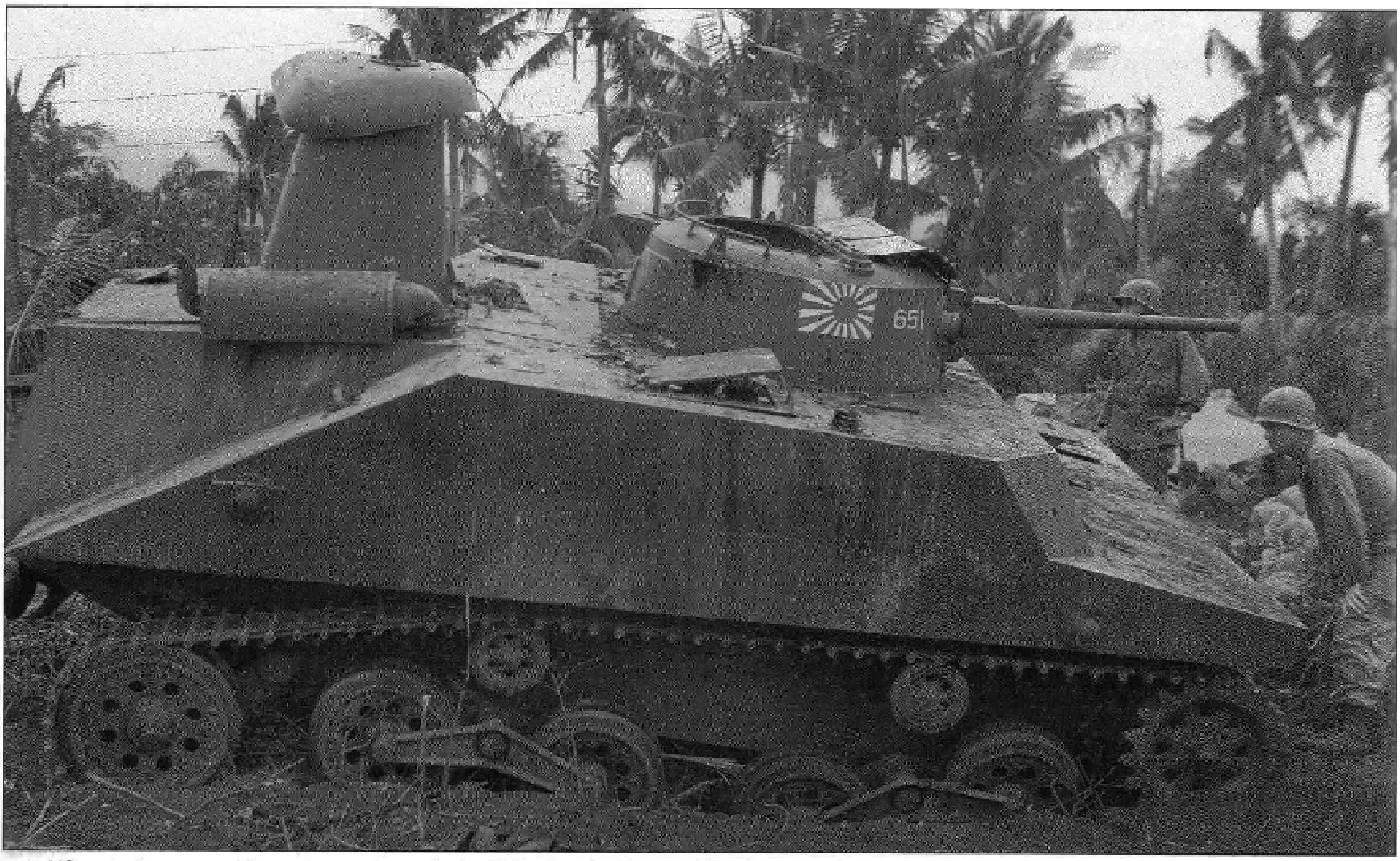
The Army landings on Luzon in the Philippines were supported by amtracs. Here, a pair of LVT-4s move through Binmeley village on Luzon on 9 January 1945. (US Army)



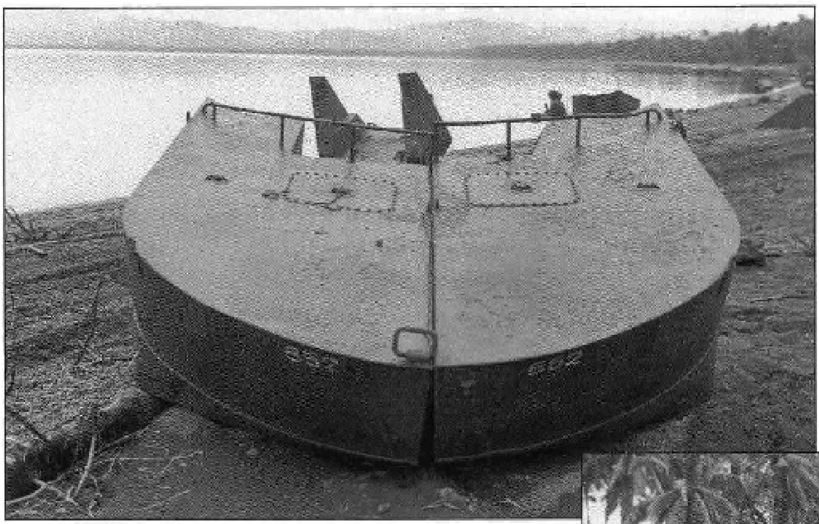
Army LVT-4s move up troops on Luzon in January 1945. A total of four amtrac battalions were used during the landings in Lingayen Gul on 9 January 1945. (US Army)



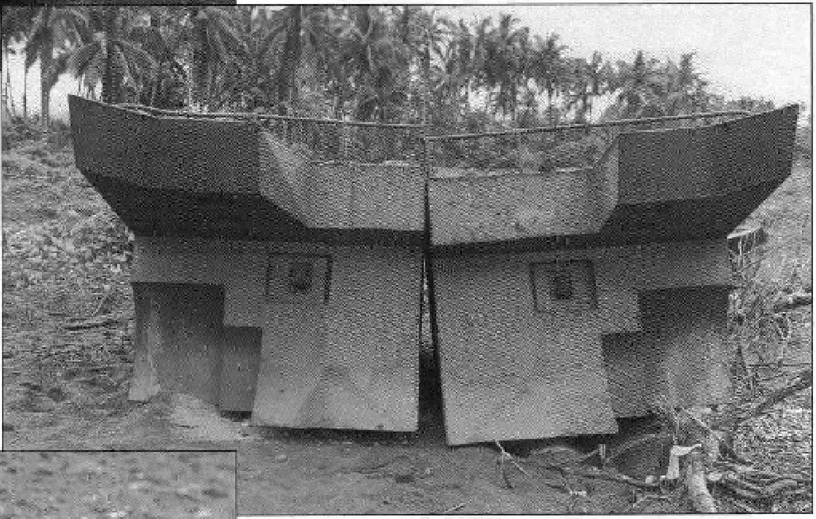
Unlike US amtanks, the Japanese Type 2 Ka-mi used detachable pontoons for buoyancy. These were attached using a set of crab-claws that can be seen on the rear panels of the hull. The trunk on the engine deck was to prevent the engine from becoming flooded, and this too could be detached on reaching land. (US Army)



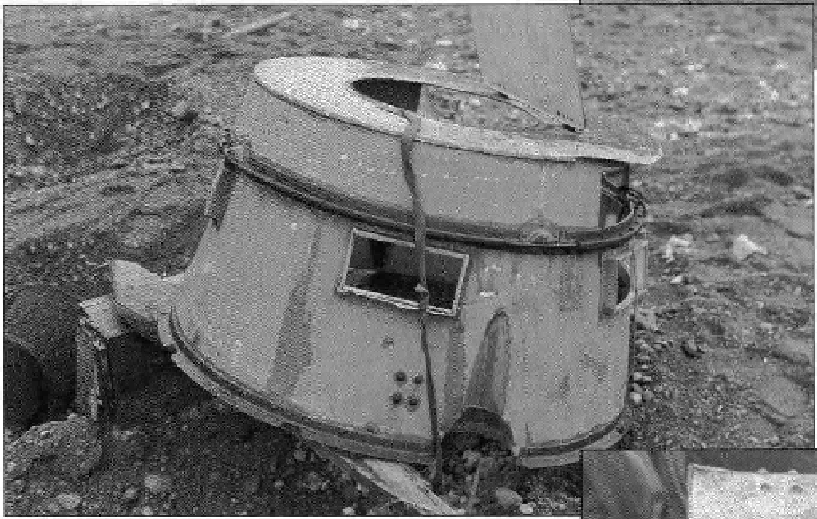
US amtanks were not the only ones in use in the Philippines in 1944-45. The Japanese Special Naval landing Forces (SNLF) landed a number of Type 2 Ka-mi amphibious tanks near Ormoc on Leyte on 7 December 1944. (US Army)



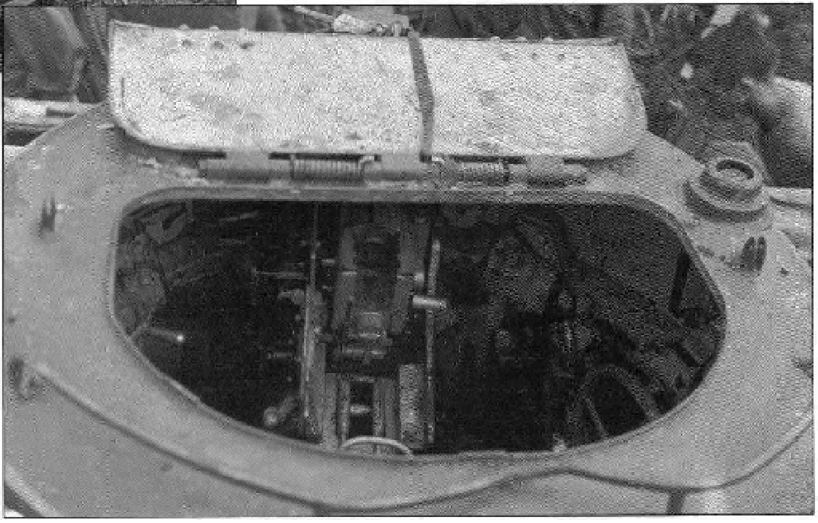
This is a set of bow pontoons from one of the Ka-mi amphibious tanks that landed at Ormoc bay. The vehicle number can be seen painted on the bow. (US Army)



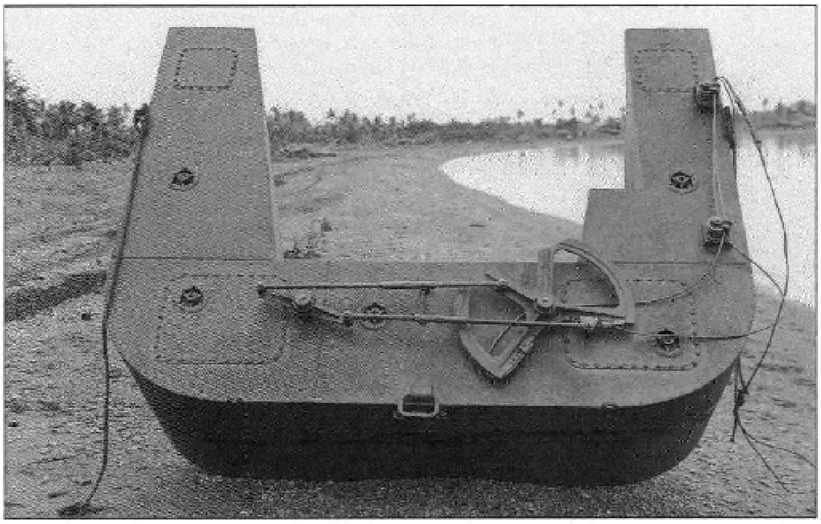
A rear view of the bow pontoons shows that it was in fact made up of two parts. The small square indentations in the lower portion of the pontoon are the attachment points which were gripped by the crab-claws on the tank hull. (US Army)



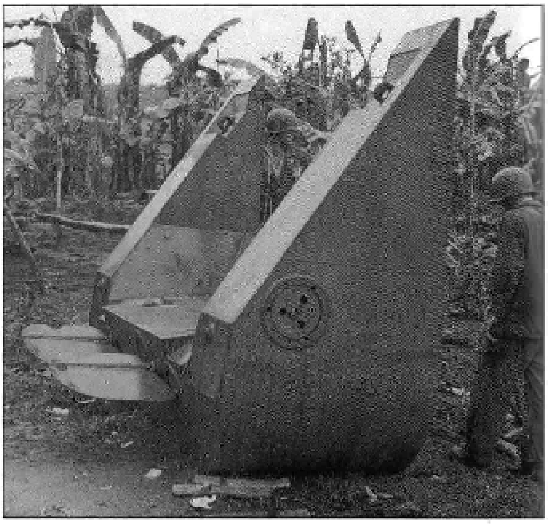
The Type 2 Ka-mi turret hatch was covered by this turret cover which also allowed the tank commander to get a better view of the beach area during the approach.



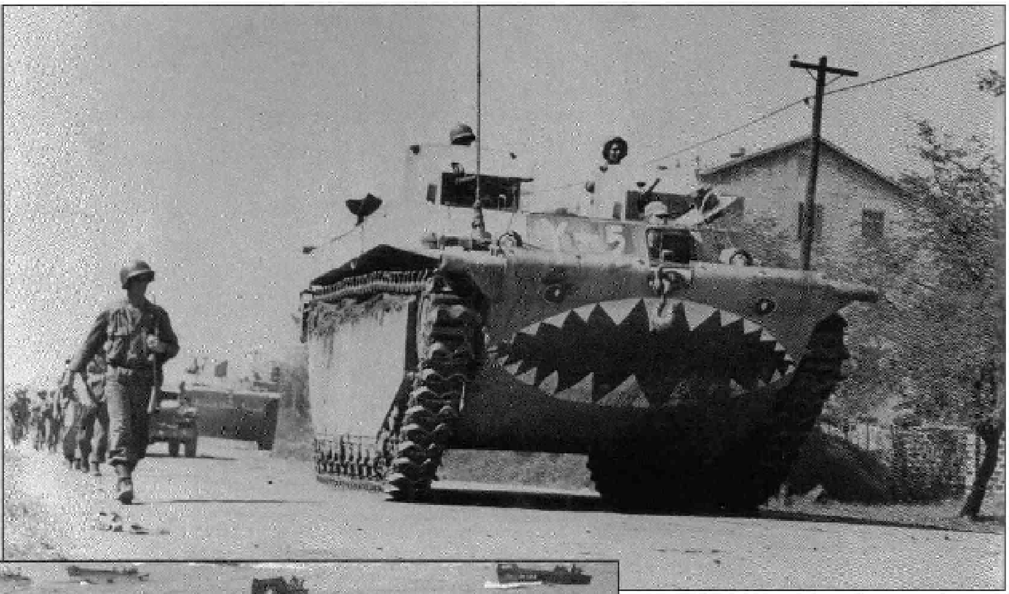
A detail view looking into the hatch of a Type 2 Ka-mi, and showing the gun breech of the 37mm gun. (US Army)



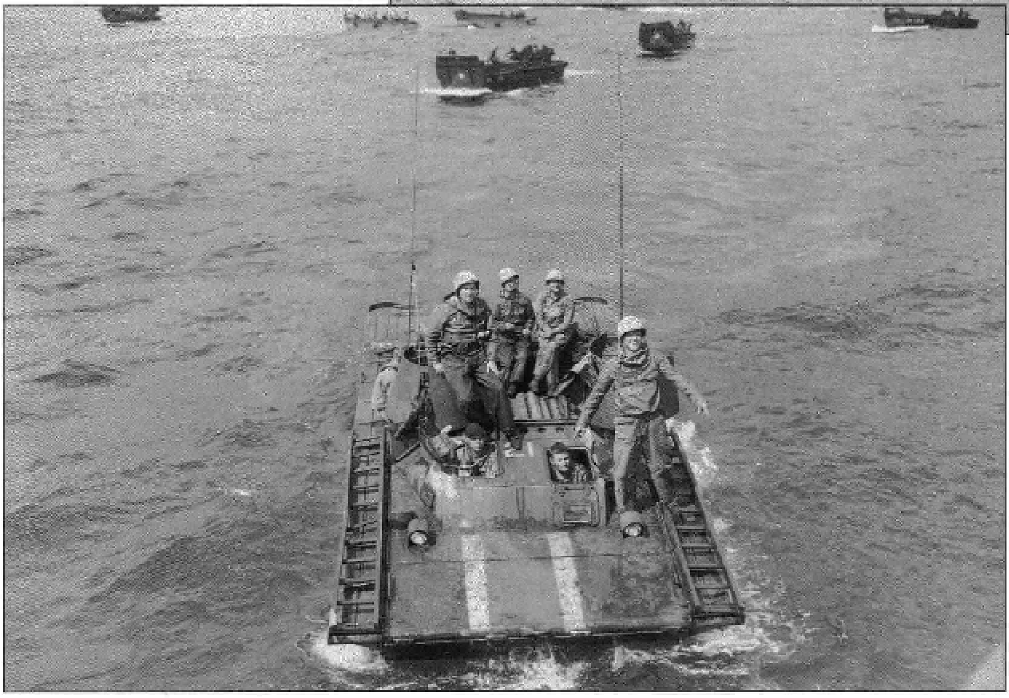
A detail view of the rear pontoon from a Type 2 Ka-mi. The complicated set of cables and mechanisms were used to operate the rudders under the pontoon to steer the tank in the water. (US Army)



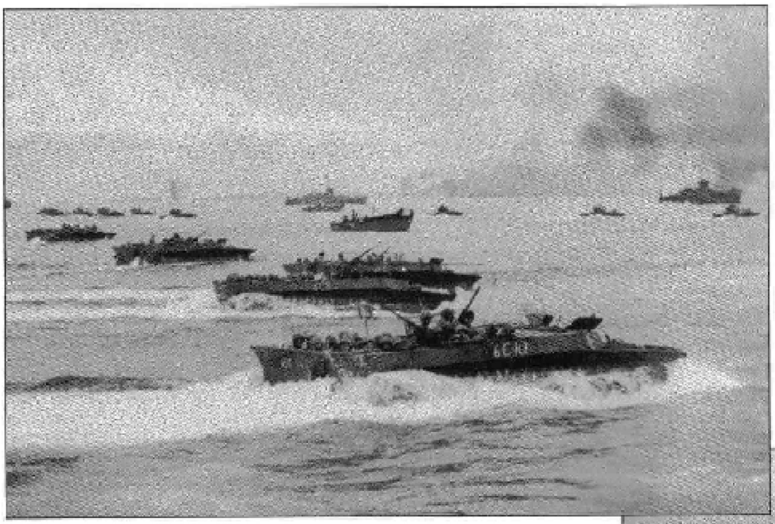
A view of the lower portion of the pontoon shows the rudders as well as the attachment lugs used to clip the pontoon to the tank hull. (US Army)



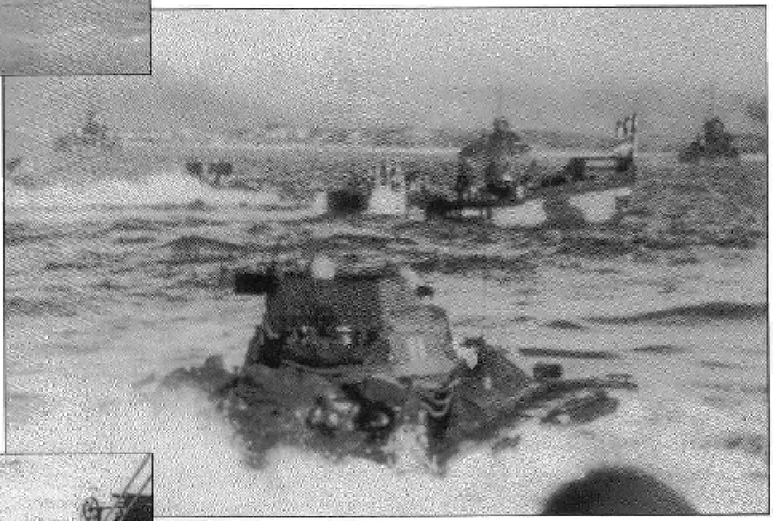
The LVT-4s continued to be used to move troops forward, and are seen here on the approaches to Manila on 7 February 1945 on a colorfully painted amtrac. By this stage, standardized armored shields for the amtracs had begun to appear, this being the D706880 armored cradle and pintle mount.



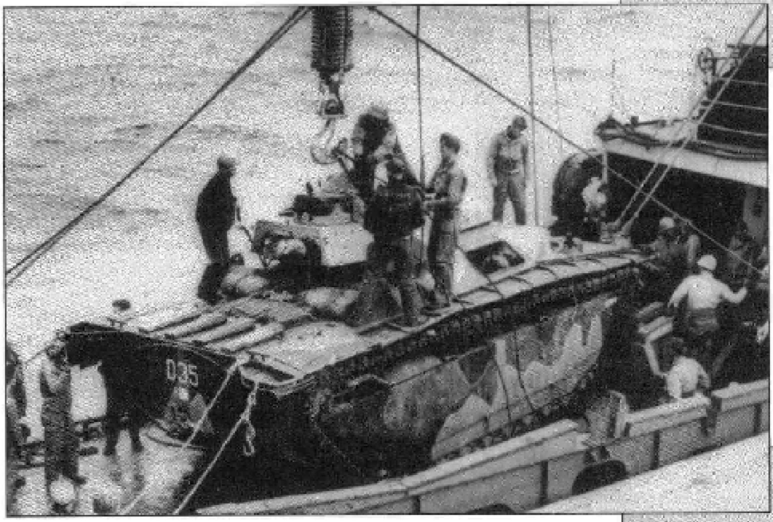
The next major Marine offensive was against the volcanic island of Iwo Jima in February 1945. This is a LVT(A)-2 from the Marine 4th Amphibian Tractor Battalion getting orders from a control boat before heading to shore. Note the scaling ladders on the fenders. These were used for many things, including as chutes for unloading cargo. (USMC)



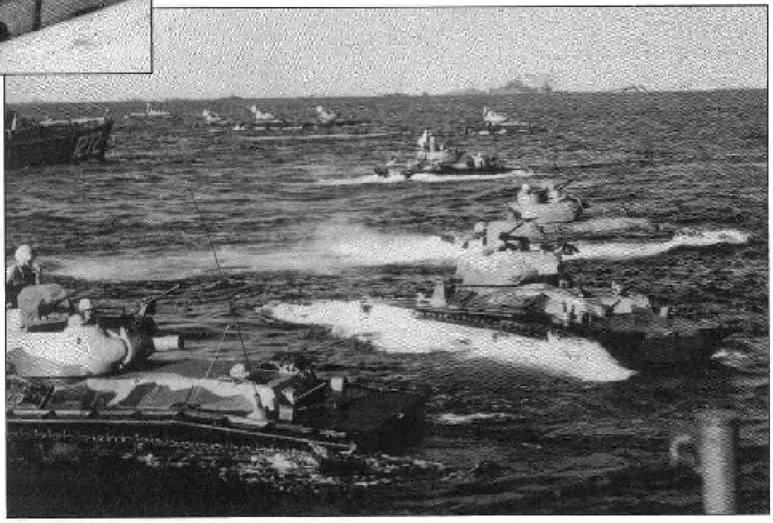
Amtracs move ashore at Iwo Jima. These are mainly LVT-4, with some LCVP landing craft and LCIs in the background. (USMC)



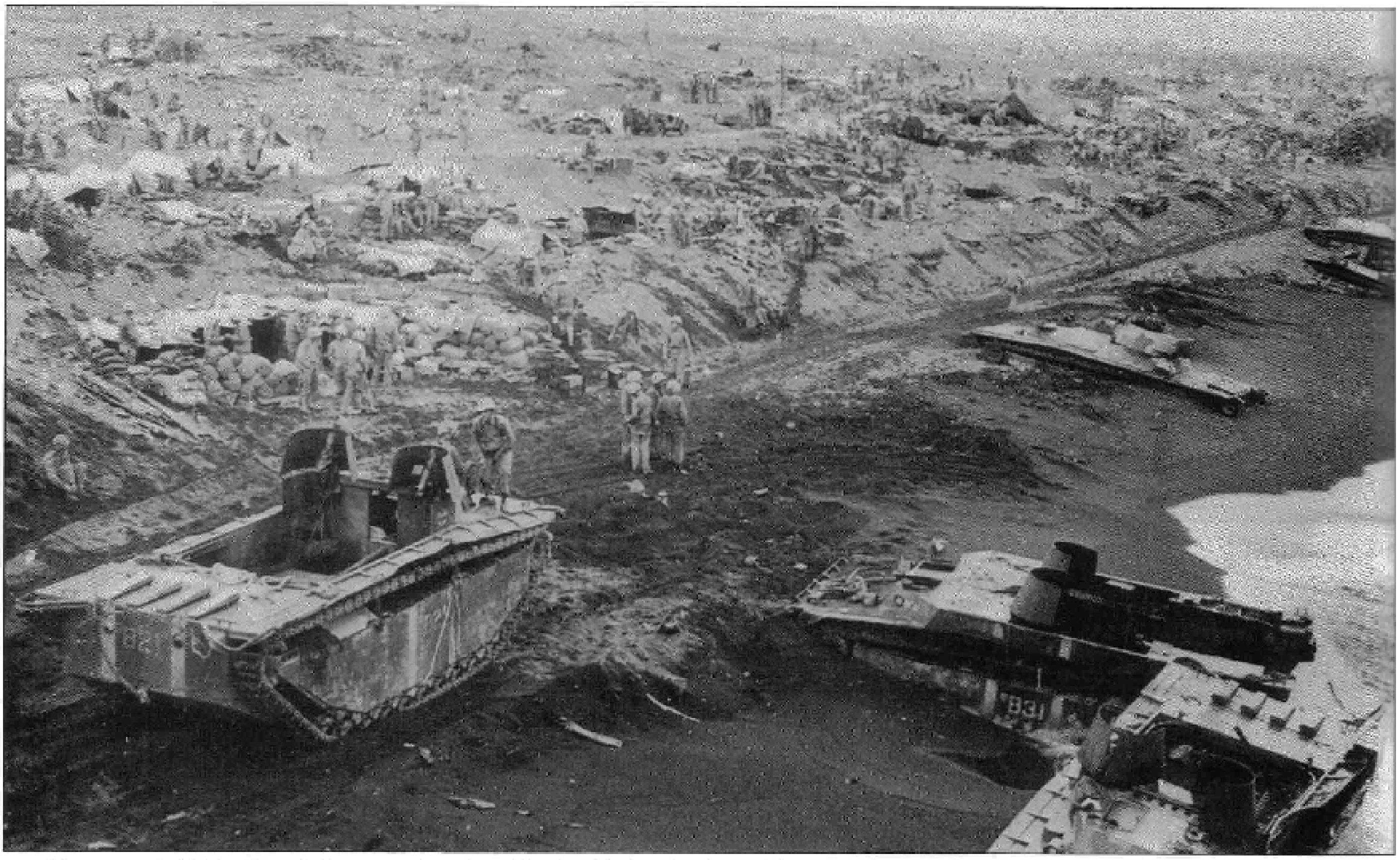
A LVT(A)-4 amtank swims to shore. By this stage, Marine depots had begun modifying the LVT(A)-4 turret by constructing a parapet around the rear to better protect the commander/machine gunner. (USMC)



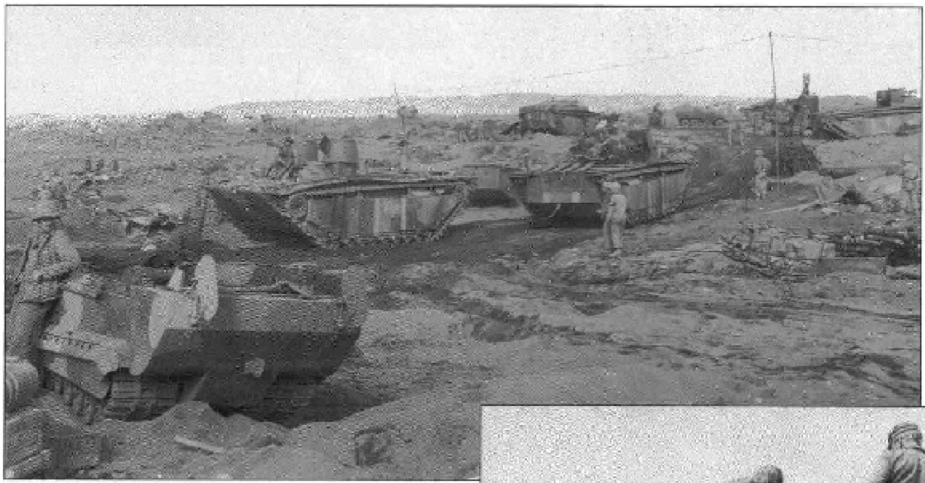
A camouflaged LVT(A)-4 is prepared for lowering into the water. Most amtanks and amtracs were carried into the battle area on LSTs, but sometimes they were brought in by other types of transports. This LVT(A)-4 is fitted with a different type of rear turret armored parapet. (USMC)



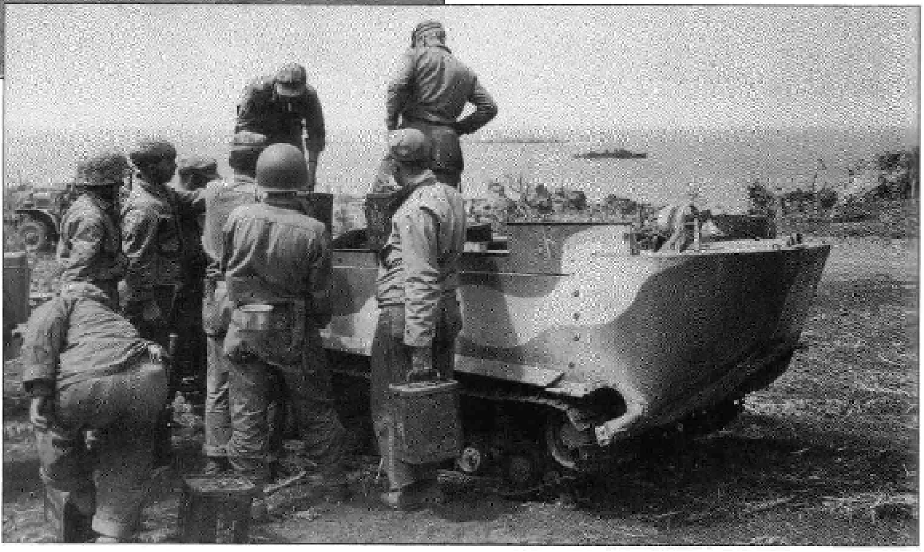
A wave of LVT(A)-4 amtanks move to shore. These are fitted with the circular armored parapet, with large expedient armored shields for their .50 cal machine gun.



The congested Yellow Beach 2 area on Iwo Jima. The hot black volcanic sand has already started to envelope some of the amtracs and amtanks disabled near the shoreline. This view shows a couple of LVT(A)-2 amtracs including "B-21" to the left, a LVT-4 (B-31) and a LVT(A)-4 amtank. (USMC)

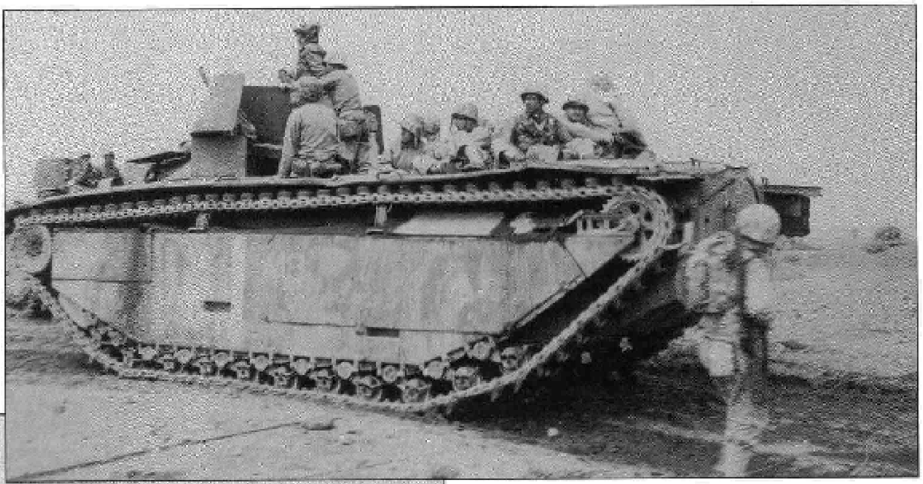


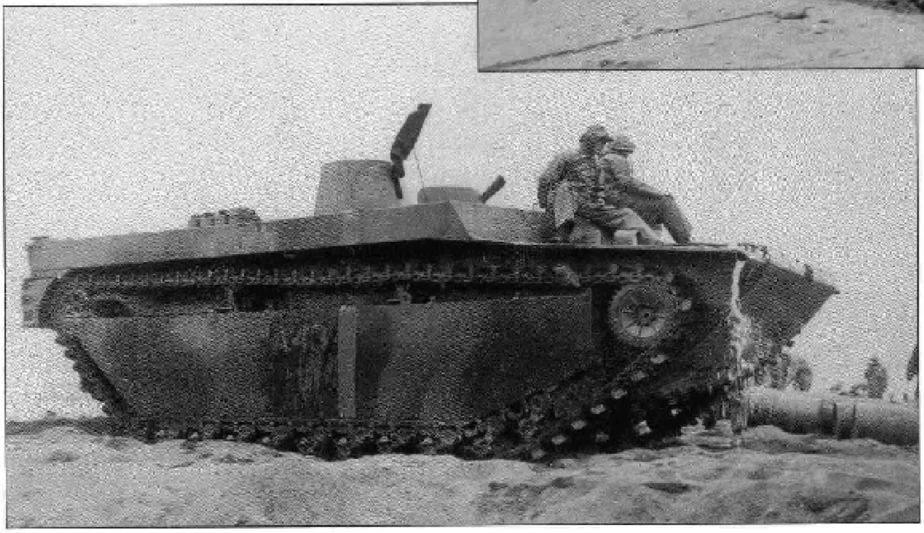
The staging area beyond the shoreline at Yellow Beach 1 on Iwo Jima. In the foreground is a M29C Weasel, not commonly seen in the Pacific until Iwo Jima. Careful inspection between the two nearest LVT(A)-2 will reveal one of the amphibious trailers sometimes towed by the amtracs. (USMC)



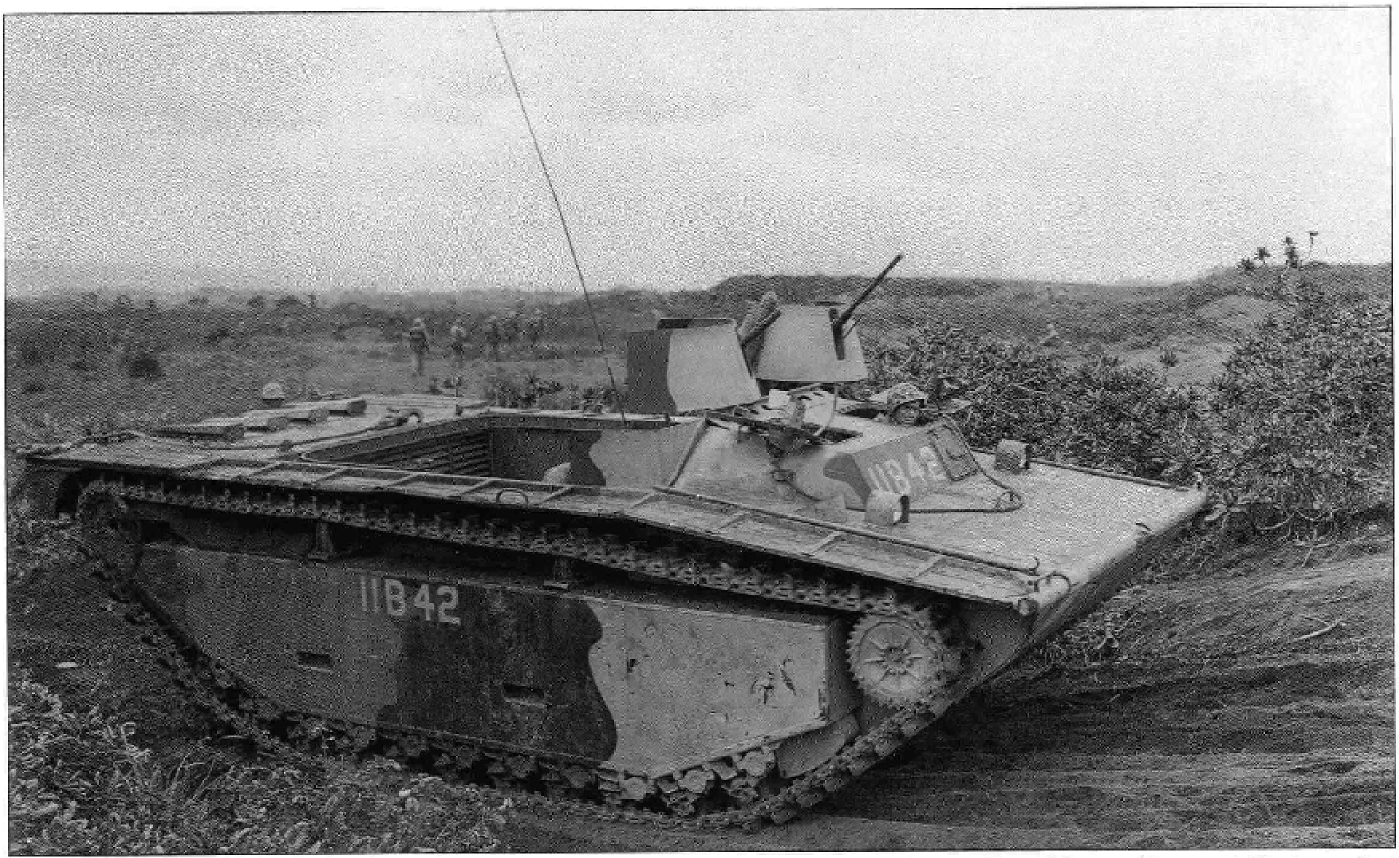
Marines do maintenance on a M29C Weasel on Iwo Jima. These small amphibious utility vehicles were more common in the European theater than in the Pacific. (USMC)

A LVT(A)-2 moves Marines forward during operations on Iwo Jima. This vehicle has added applique armor plate on the hull side in at least two panels. (USMC)

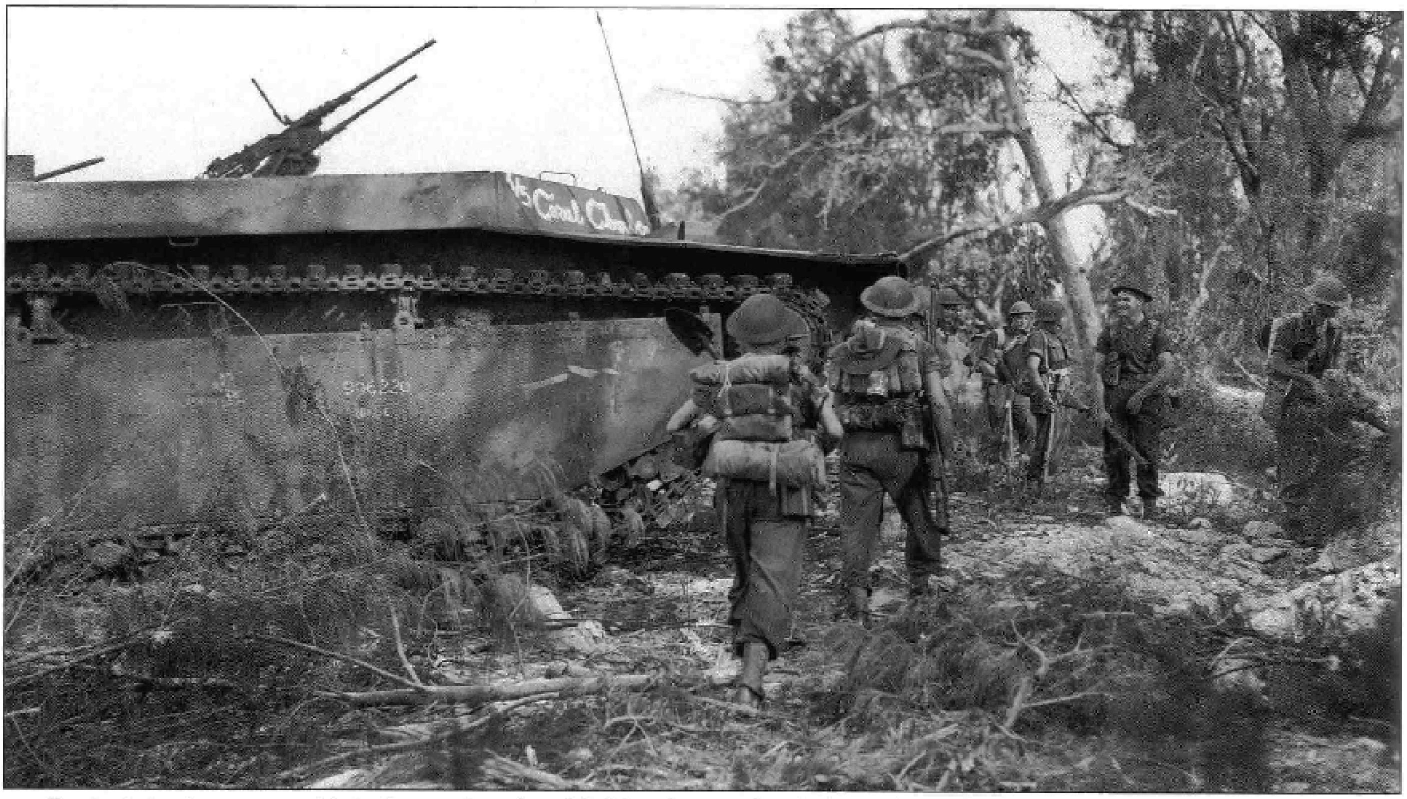




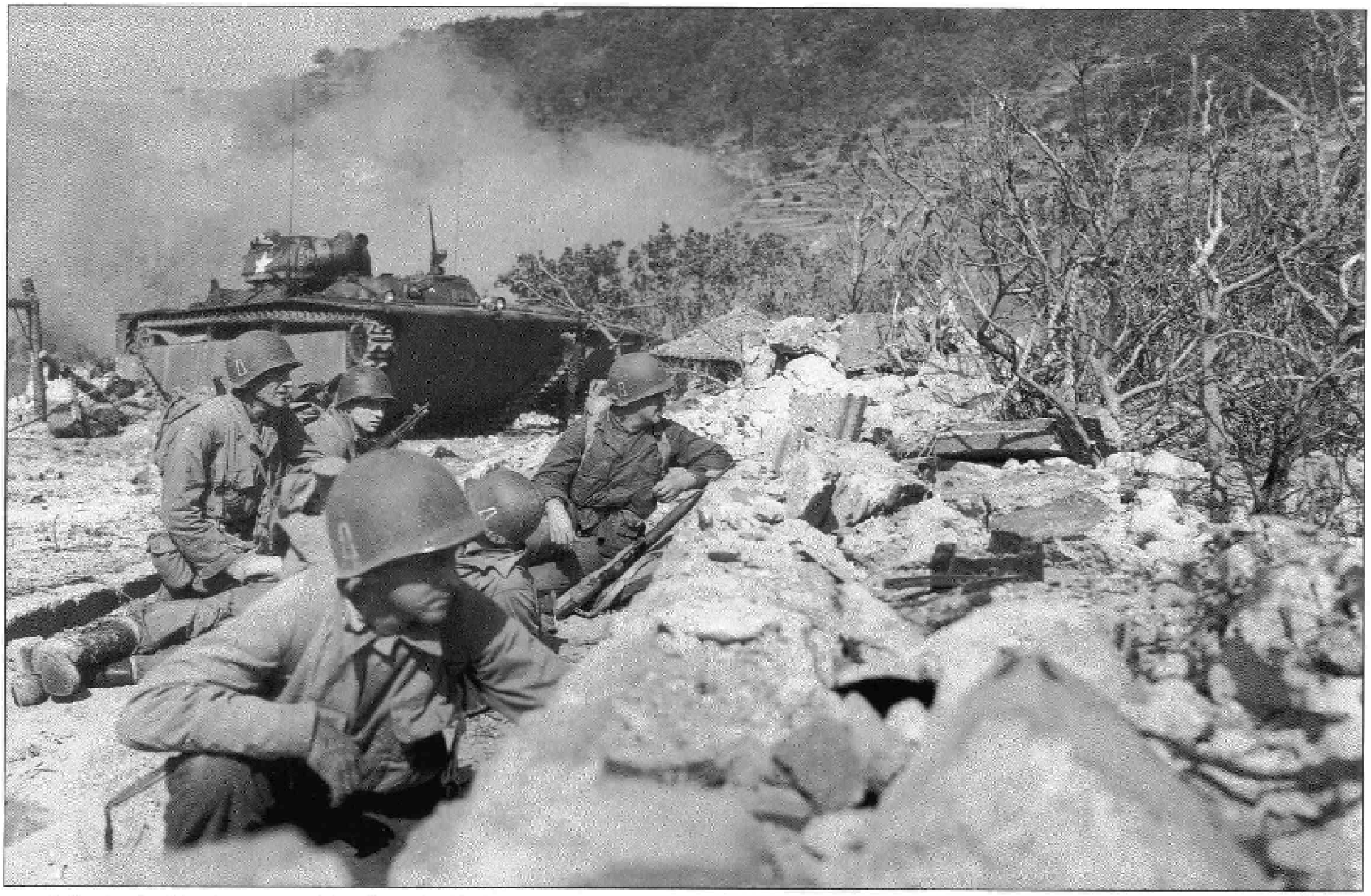
A LVT-4 moves forward on Iwo Jima, probably at Yellow Beach 1. This is fitted with the circular pattern shields worked up by Navy depots in the Pacific for the amtracs. Although not officially standardized, these shields followed a number of standard patterns by late in the war. (USMC)



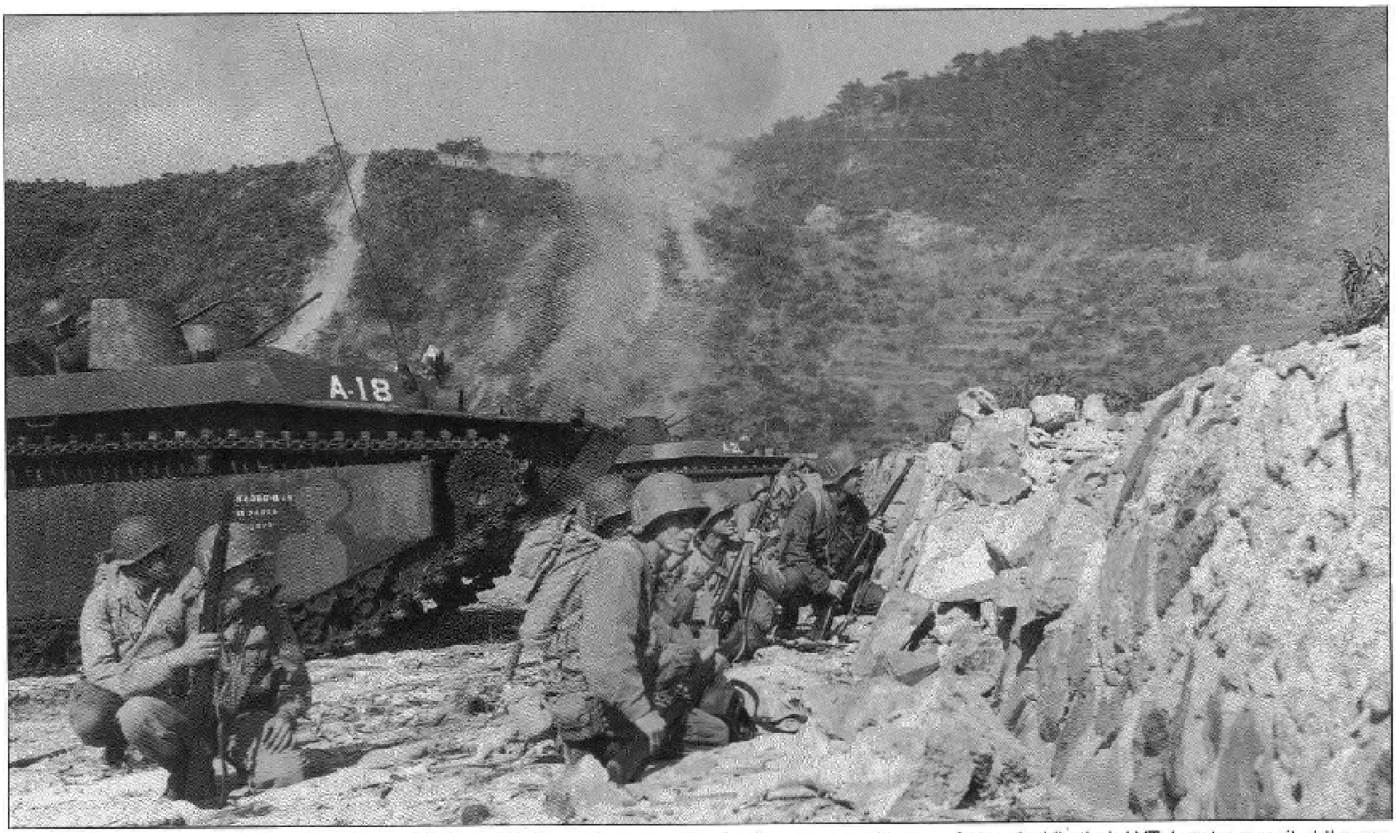
A camouflage LVT(A)-2 carries back injured Marines during the fighting for Iwo Jima. The markings on this vehicle are a bit unusual. The two vertical stripes in front of the tactical code are not the number "11", but the two yellow bars to indicate Yellow Beach 2. (USMC)



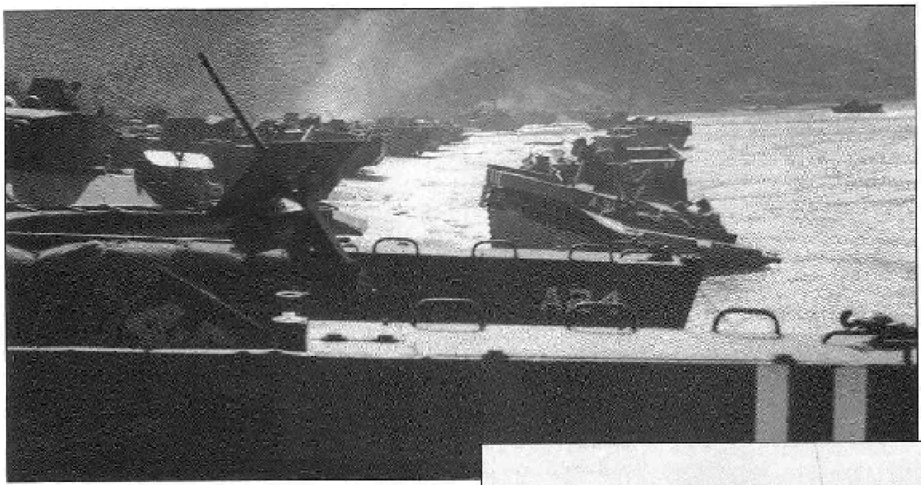
The Australian Army was provided with a small number of Buffaloes for operations in the south-west Pacific, serving with the 1st Australian Armoured Amphibious Squadron. This Buffalo IV (LVT-4) nicknamed "Coral Climber" has brought ashore troops of the Australian 24th Infantry Brigade Group on Labuan Island, Borneo, Dutch East Indies on 10 June 1945 during Operation Oboe Six. (US Army)



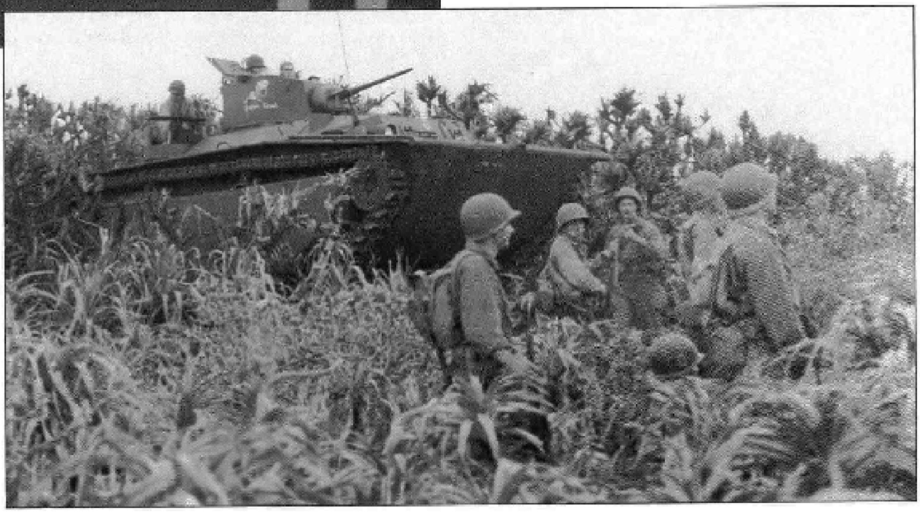
Following the bloody capture of Iwo Jima, the Marines and Army turned to a combined operation against Okinawa, on Japan's doorstep. The campaign began with the amphibious landings against a number of the outer islands of the Ryukyus chain, including Operation Iceberg by the 77th Division near Zamami Shima, on Kerama Rhetto. The Army infantry hunker down near the sea wall while the LVT(A)-4 amtanks provide covering fire. (US Army)



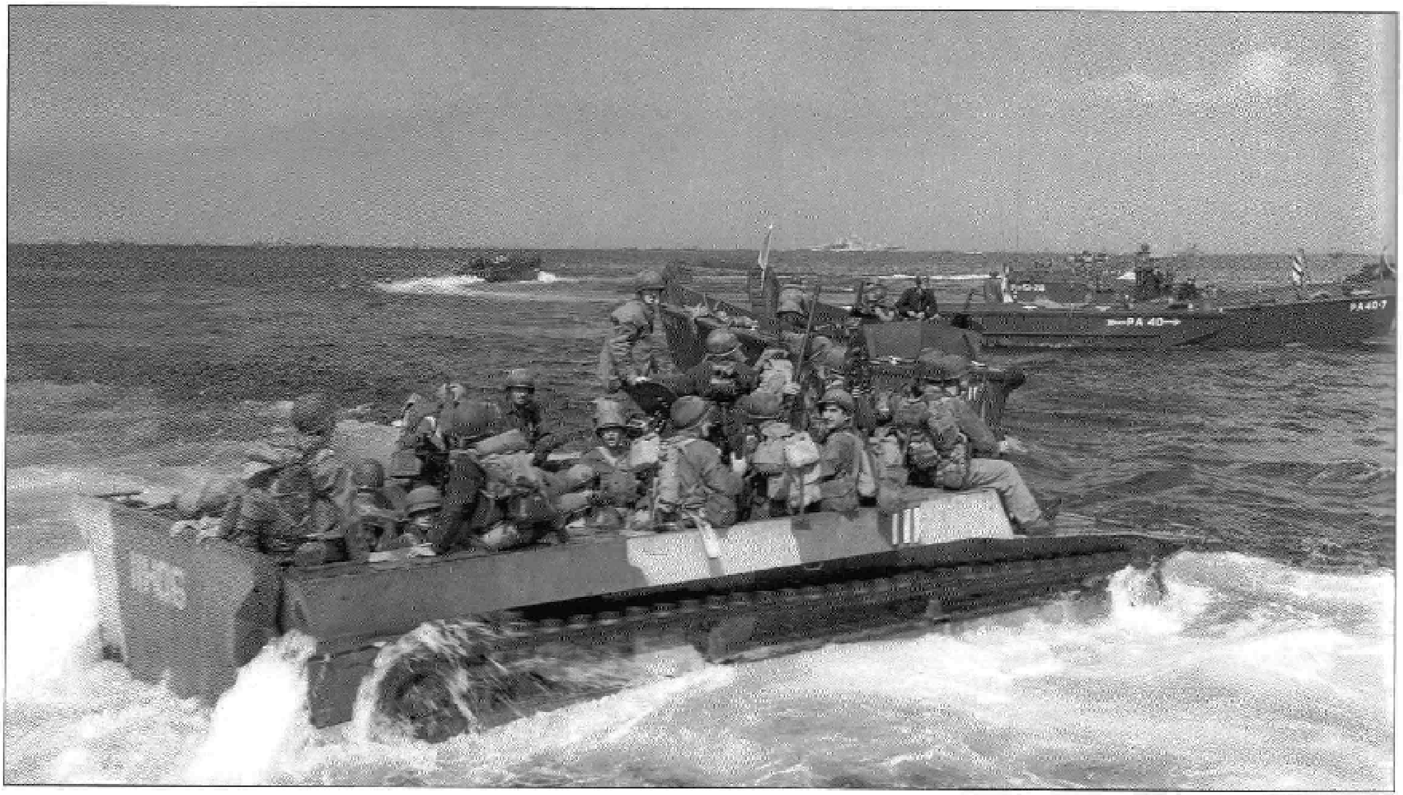
Another view down the beach at Zamami Shima with Army infantry waiting for the command to move forward while their LVT-4 amtracs wait at the sea wall. The capture of these islands were a vital first stage to the assault on Okinawa since they managed to capture much of the fleet of Japanese suicide boats, and secured a sheltered anchorage for the Navy's ships. (US Army)



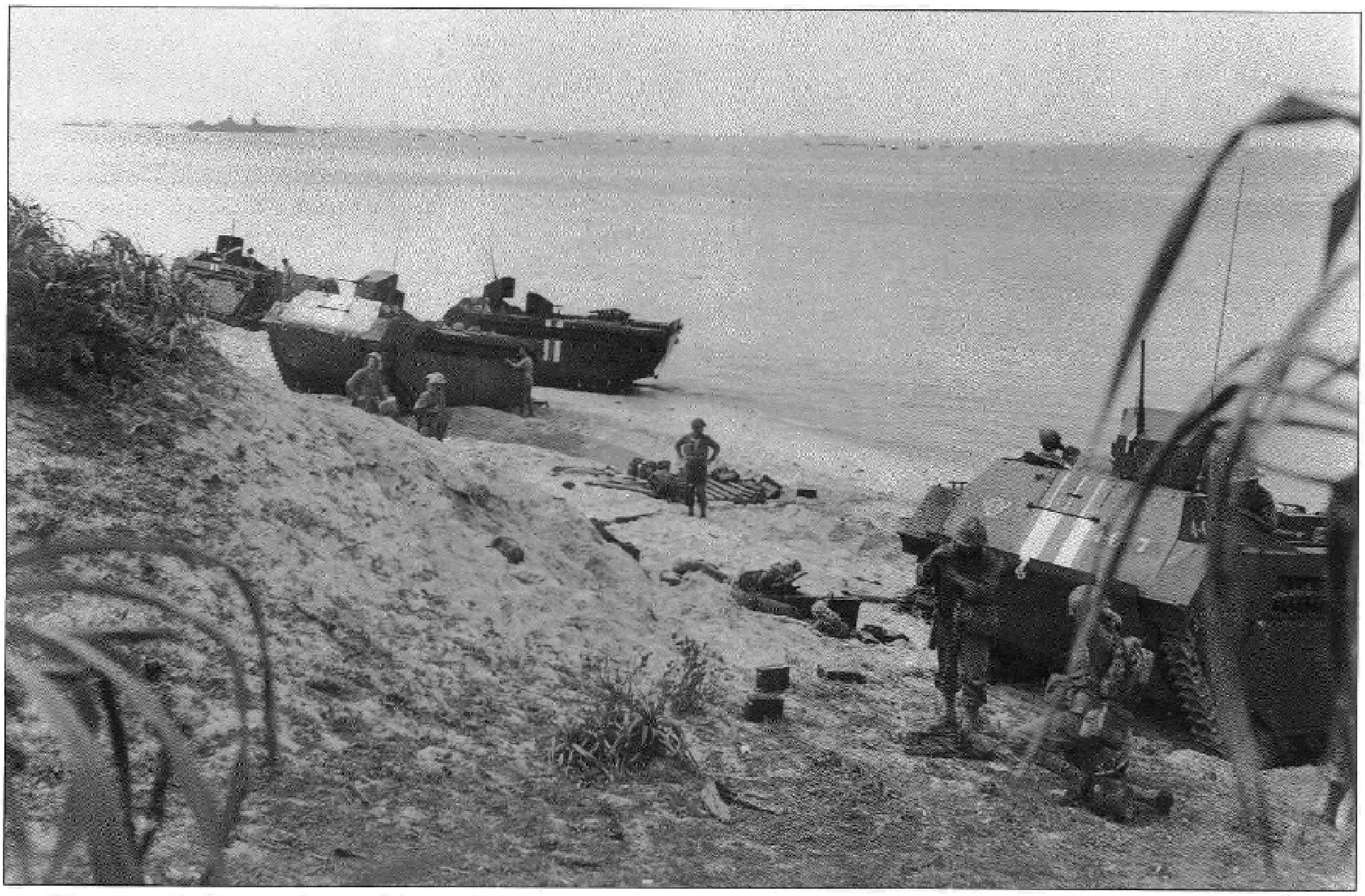
The sheer volume of amtracs used in Operation Iceberg is evident in this view down along the beach. The beach area was unusually congested since the sea wall prevent the amtracs from moving further inland until breaches could be made. Aside from the many LVT-4 amtracs, the turret of an older LVT(A)-1 amtank is also evident at the extreme left. (US Army)



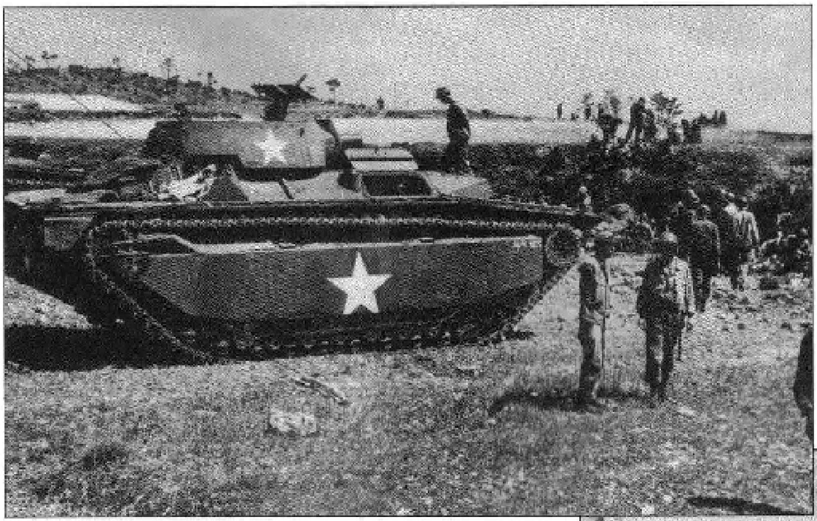
An Army LVT(A)-1 amtank crushes through the thick underbrush during the advance on Keise Shima on 31 March 1945. In the foreground are infantry of the 77th Division. (US Army)



With the outer islands secured, the main assault against Okinawa began on 1 April 1945. It was the largest use of amtracs in the entire war, with some 1,400 LVTs of various types on hand, roughly two amtrac battalions per division in the initial wave. This LVT-4 is bringing troops of the US Army 7th Infantry Division ashore on 1 April 1945.

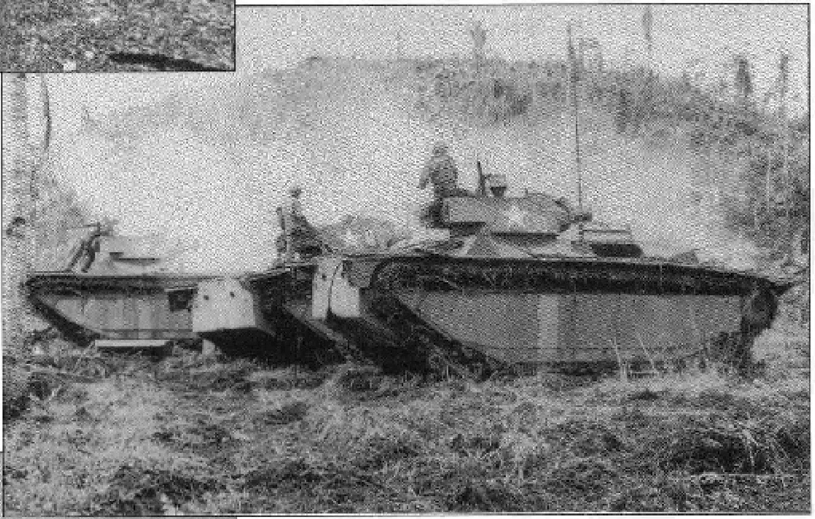


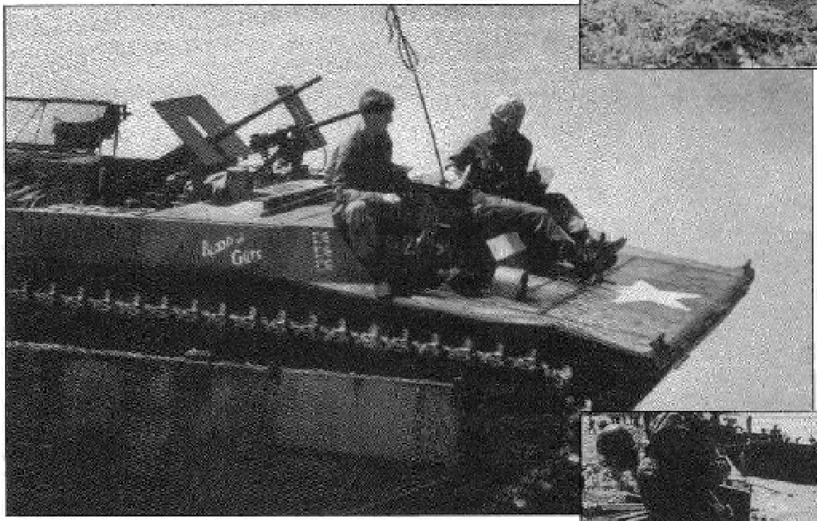
Okinawa saw the first extensive use of the new LVT-3 Bushmaster, seen here with the 1st Amtrac Battalion supporting the Marine 6th Division which landed on the northern-most beach near Youtin. The 1st Amtrac Battalion received 108 of the new Bushmasters while the 4th Amtrac Battalion received another 102. They were the only Marine units to use the Bushmaster in any significant numbers during the war. (USMC)



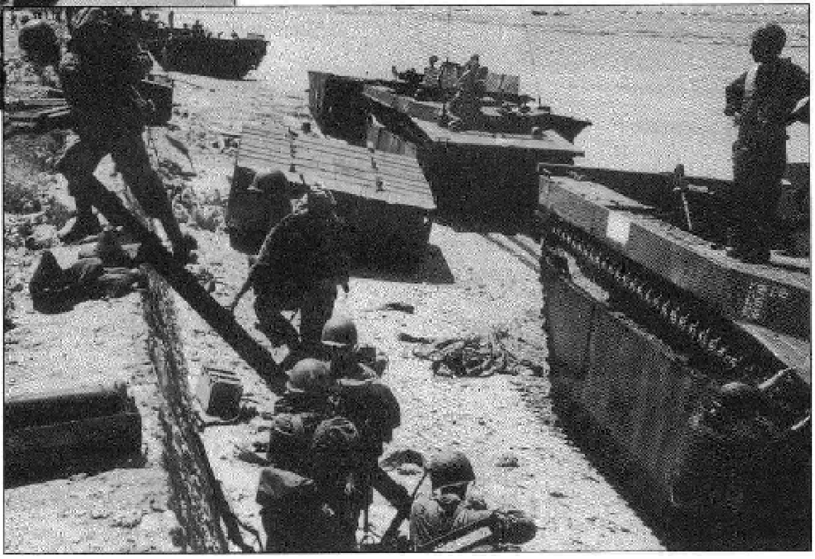
An Army LVT(A)-4 nicknamed "Sun Set" on Okinawa on 1 April 1945, the first day of the operation, while in support of the 7th Division near Kadena airfield. (US Army)

Army LVT(A)-4 amtanks provide fire support for the 7th Division on Okinawa. Japanese resistance on Okinawa was so fierce that in general, the amtanks were no longer used for direct support of infantry, and M4A2 and M4A3 tanks were used instead. Even the tanks suffered grievous losses to close-in Japanese attacks with improvised anti-tank weapons. (Patton Museum)

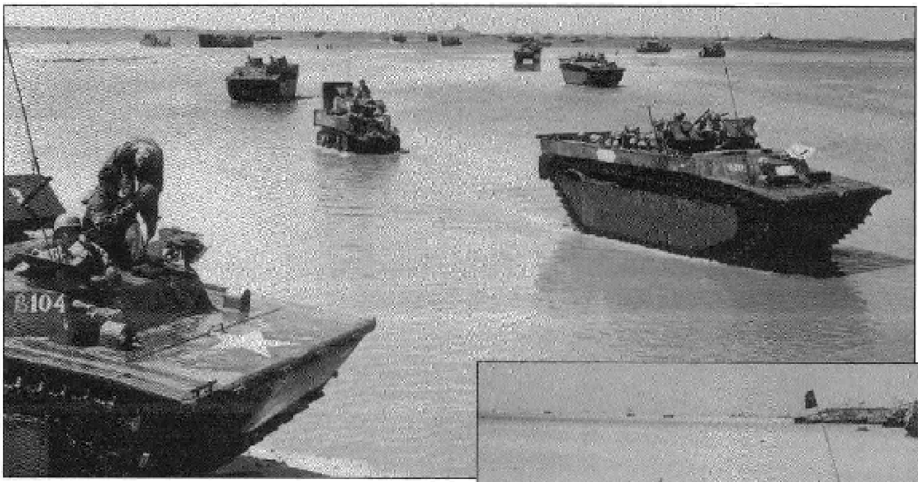




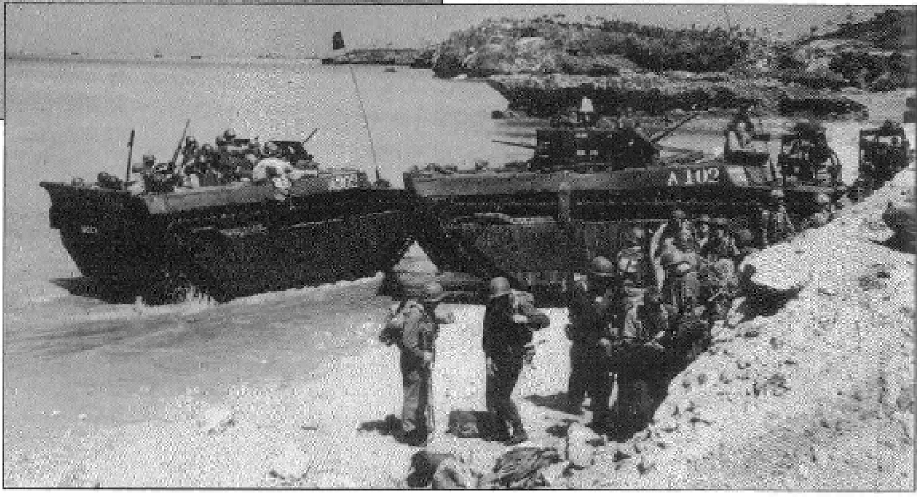
An Army LVT-4 waits near the shore on Okinawa on 1 April 1945. Nicknamed "Blood and Guts", it carries three small Japanese flags on the side. (USMC)



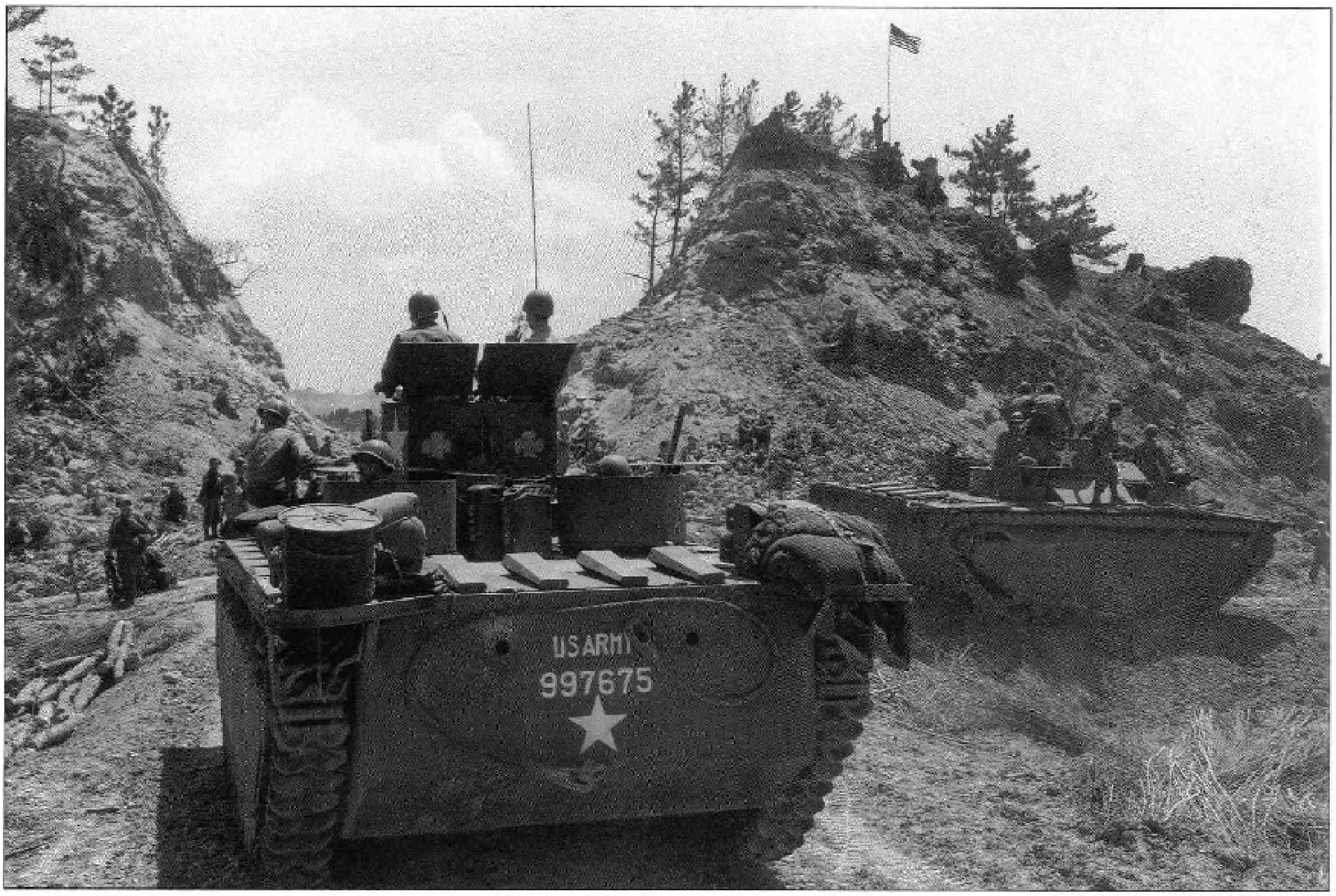
The Army 7th and 96th Divisions landed on the two southern-most beaches near Kadena airfield. This view shows why many amtracs carried scaling ladders during landing operations, since sea walls were a common problem. (USMC)



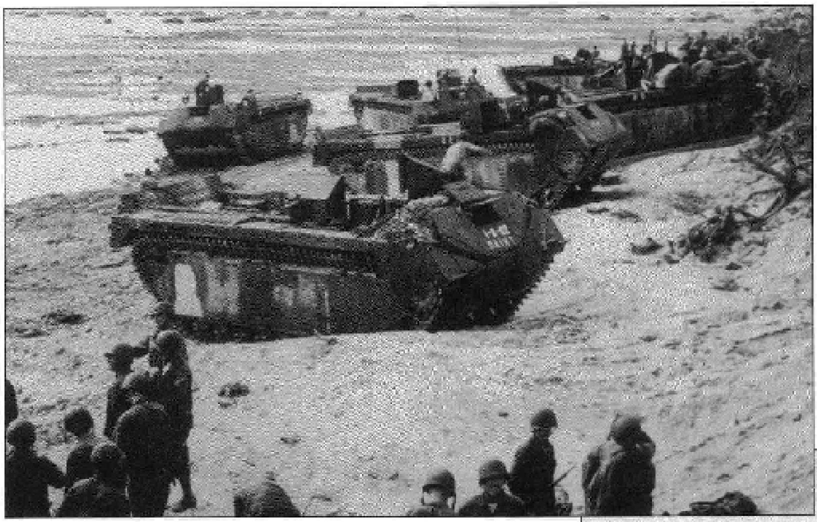
LVT-4 amtracs bring in a wave of US Army infantry at Okinawa on 1 April 1945. Note that in the center is an Army M5A1 light tank with wading trunks escorting the amtracs. (USMC)



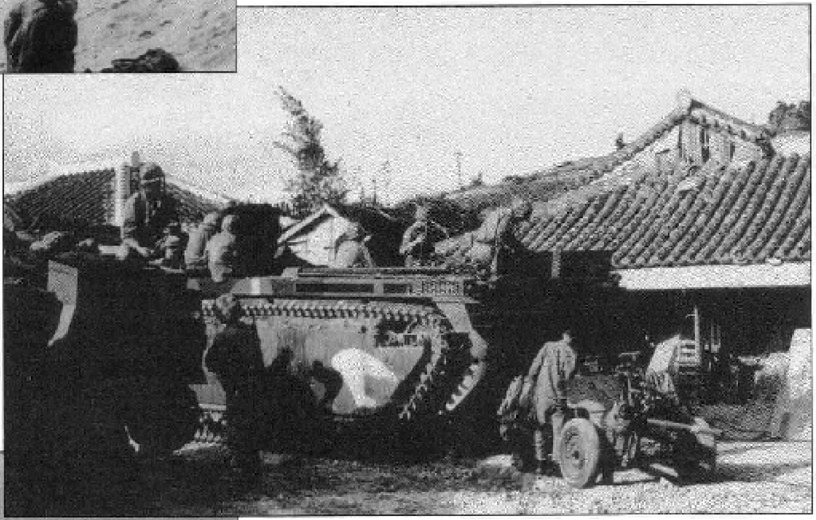
Army infantry disembarks on Okinawa on 1 April 1945 with their LVT-4 amtracs in the background. (USMC)



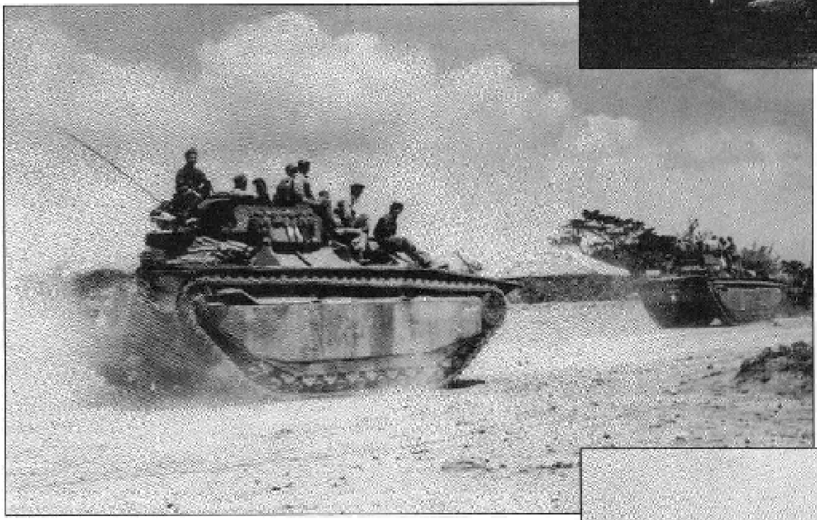
A pair of LVT(A)-1 amtanks provide support for the 96th Division on Okinawa on 1 April 1945 as the unit moves through Chatan village. The shamrock insignia on the rear of the turret may be the battalion tactical marking.



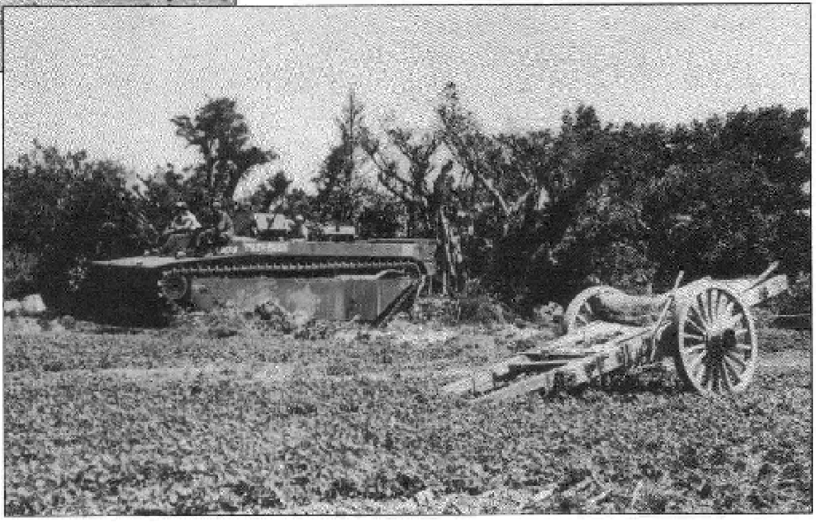
A group of LVT-3 Bushmasters on the beach at Okinawa on 10 April 1945. Even after the initial landings, the amtracs were used to move subsequent reinforcements from ship to shore. The nearest vehicle has "MAINT" painted below its tactical number, probably indicating it is used by the battalion maintenance platoon. (USMC)



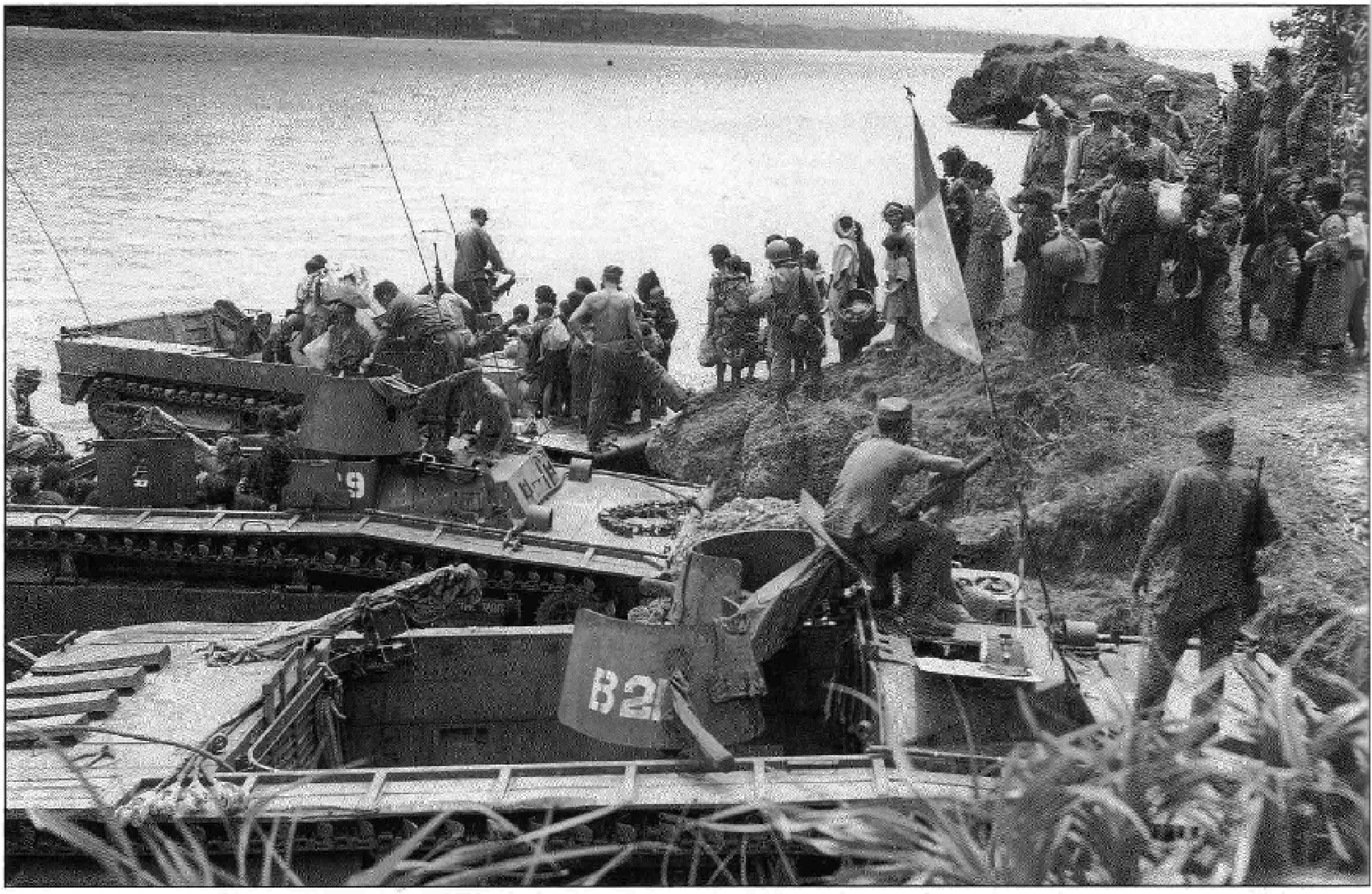
A LVT-3 Bushmaster moves inland in support of Marine units on Okinawa. Troops are attempting to attach a 37mm anti-tank gun to it. (USMC)



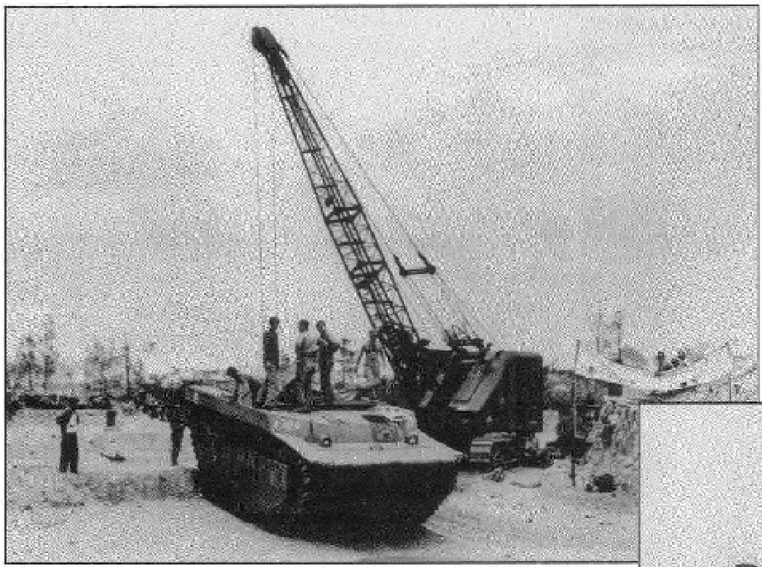
Some Army LVT(A)-4 amtanks pass across the runway at Kadena airfield while moving forward on 14 April 1945. This amtank has a prominent panel of applique armor on the hull side. (USMC)



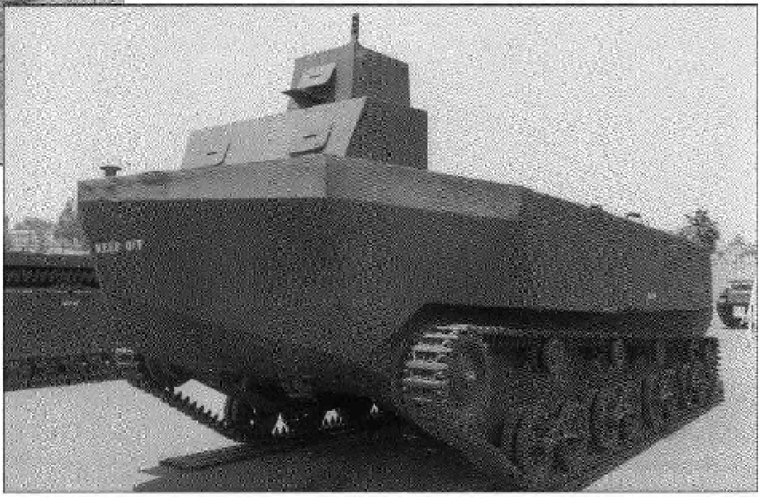
An Army LVT-4 named "Push-Push" moves through a farm field on Okinawa on 19 April 1945. (USMC)



The Army's 27th Division was assigned the attack on some of the outer islands off Okinawa including Tsugen Shima. Here, troops of the 105th Regiment, 27th Division load civilians from Kouri-shima on LVT(A)-2 and LVT-4 amtracs for transport back to the mainland on 20 June 1945. (US Army)



An Army LVT-4 is loaded using a crane on Okinawa following the fighting. (US Navy)



Japan's equivalent of the amtrac was the Type 4 Ka-Tsu amphibious vehicle. By the time it entered service in 1945, it was no longer needed for amphibious assaults. Some were fitted with torpedoes, with the intention of sending them into sheltered atolls used by the US Navy for ship repair to attack US warships. The war ended before these attacks took place. A single Ka-Tsu was preserved at the US Marine Corps' Camp Pendleton amtrac museum.

BLOCK BUSTER

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